AIR CONDITIONING HEATING & REFRIGERATION NEWS
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Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Merry Christmas!
Grandma Has To Go
Little Monster Dept.
Sober Note
All People Smile In The Same Language
They'll Get You Every Time
Problems of Parenthood
You Can't Lick 'em
The TV Western Effect
Little Fiends Dept.

Merry Christmas!

Christmastime is children's time, and isn't it wonderful?

Herewith, to help celebrate the occasion, a choice group of anecdotes about children.

Grandma Has To Go

Entranced by Missie's beatific smile, lady on a department store escalator thrilled to her:

"Going to see Santa Claus upstairs?"

"Not yet," Missie was truthful. "Grandma has to go to the bathroom first."

What can a child give the man who has everything?

Penicillin.

"Please don't be sore," Mr. President warned his Vice President in charge of Sales, "but we aren't holding an Office Christmas Party this year."

"Sore?" the V.P. surprised. "I'm glad. Now I won't have to spend a week apologizing to people who weren't even there."

Little Monster Dept.

"Piggy banks are skunky," deprecated Suzy. "Teacher says they 'incline' us children to be stingy."

"Uh-huh," chimed in Ruthie. "And they turn parents into bank robbers."

Five small boys doggedly dragged a big bumping sack through the crowded aisles of a department store. It was Christmas-time.

"Tut tut, lads," admonished a floor walker, "you're creating a traffic hazard. Don't you want Santa Claus to come to your homes?"

"Who," panted the leader boy, "do you think we have tied up in this sack?"

Nine-year-old Johnny loved toy soldiers. His younger sister was crazy about painted dolls.

They're teens now, and she loves soldiers; while Johnny is eager for painted dolls.

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G-E Puts All Cooling Depts. Under 1 Head

LOUISVILLE, Ky. — General Electric's room air conditioner and central air conditioning businesses will be consolidated into one Air Conditioning Dept. on Jan. 1, C. K. Rieger, General Electric vice president and general manager, Appliance & Television Receiver Div., has announced.

Carl W. Moeller, presently general manager of the Room Air Conditioner Dept., will head the new, combined department. His headquarters will remain at Appliance Park.

Carl A. Salmonsen, general manager of the company's Air Conditioning Dept. since it became part of the Appliance & Television Receiver Div., will become consultant to Moeller and manager of the Bloomfield, N. J. plant. Salmonsen will be eligible for retirement at the end of next year.

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Cory Hits Mitchell With Fraud Suit

CHICAGO — A suit charging fraud, breach of contract, and concealment of facts against officers of the former Mitchell Mfg. Co. was filed in Superior Court here recently by Cory Corp.

Cory purchased Mitchell in November, 1955 for $1,564,209. But, Cory now charges, a financial statement on the financial position of Mitchell as of June 30, 1955 concealed an excise

(Concluded on Page 11, Col. 4)

NEMA Issues Standard To Test, Rate Room Air Conditioners

Nameplate To Give B.t.u. Capacity

NEW YORK CITY—A new standard for rating and testing room air conditioner performance and setting certain minimum characteristics was issued recently by the Room Air Conditioner Section of the National Electrical Manufacturers Association.

The standard provides that units built to its requirements shall carry a nameplate on which the manufacturer will give its total cooling and/or heating capacity in B.t.u.h. as tested and rated under the standard.

Copies of Standards Publication No. CN-1-1958 are available from NEMA at 30 cents per copy, according to Joseph B. Ogden, chairman of the Room Air Conditioner Section and vice president of Airtemp Div., Chrysler Corp.

Ogden said that the standard establishes uniform procedures for determining the performance of room air conditioners under specified test conditions and sets certain minimum characteristics for the units.

He added that it contains "the industry's definition" of a room air conditioner.

This is "an encased assembly designed as a unit primarily for mounting in a window, or through a wall, or as a console. These units are designed primarily to provide free delivery of conditioned air to an enclosed space, room, or zone. They include a prime source of refrigeration and dehumidification and means for circulating and cleaning air, and may also in-

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Business Good, CRMA Predicts Fine '59

CHICAGO — "Business is good, and next year should be even better," was the combined verdict of members of the Commercial Refrigerator Manufacturers Association, in attendance at the organization's annual fall meeting here earlier this month.

While the industry's sales volume has been slow in catching up with 1957 (in the first half it was running about 7% behind), business during the July-October period developed with such increasing strength that the final figures for 1958 should show a plus margin of about 5% on shipments, with some backlog of unfilled orders for delivery in the early months of 1959.

Total shipments in October, the report showed, were 26% over the same month last year, the largest year-to-year monthly increase in nearly 10 years.

The outlook for 1959 was developed through a series of panel discussions under the direction of CRMA's President William Fogel, of Fogel Refrigerator Co. A panel comprised of L. O. Bower, Sherer-Gillett Co.; J. D. Harris, The Warren Co.; C. V. Hill, C. V. Hill & Co.; and F. A. Celler, The Brewer-Titchener Corp., examined the over-all economic situation and translated it in terms of the industry's expectations.

In contrast to similar discussions at meetings held earlier this year, in which there was a wide divergence of

(Concluded on Page 21, Col. 1)

NCRSA Panel Ups Sales, Profits for 9 Mos.

PHILADELPHIA—Total dollar sales reported by members of the National Commercial Refrigerator Sales Association submitting figures for the third quarter showed an average increase of nearly 14% over the same period in 1957.

Marie Lawton, executive secretary, also reported that figures for the first nine months also reflect an upturn (3.83%) over 1957 and dollar net profit is considerably better — up 25.56%.

As of Sept. 30, inventories were 25.76% larger than on the same date in 1957 and accounts receivable were up 12.81%.

Miss Lawton reports that during the customary discussion of current business conditions during the board of directors meeting in November, it was generally felt that credits and

(Concluded on Page 21, Col. 2)

Heat Pump Quandary:

Too Many Dealers, Too Little Know How?

By Frank J. Versagi

NEW ORLEANS — "In their drive to establish distribution, manufacturers have franchised too many heat pump dealers without air conditioning know-how and without educating them. Careless application engineers are responsible for a sizeable share of the blame for the slow growth of the heat pump industry."

An important phase of this dealer-engineer ignorance is that of proper load calculation, according to Walter R. Yeary, manager, residential projects engineering, Air Conditioning Dept., General Electric Co., Tyler, Texas.

"Not all application engineers are ignorant of the importance of careful load determination and sufficient insulation, but there are enough to delay seriously the general acceptance of the heat pump," charged Yeary in addressing the semiannual meeting of the American Society of Refrigerating Engineers.

"Although I recognize the validity—in extremely few cases —of the theory that a complete wrap-up job increases the cost of the structure by much more than the savings realized in reduced equipment size," he continued, "the real point is that it is advantageous to the homeowner to do a complete insulating job whether or not he is buying a heat pump in most cases."

Where heat pumps are involved, the gain in unit efficiency, lower first cost and operating cost, and comfort usually offset the additional construction cost within a year or two, he insisted. He estimated that the difference in cost between a furnace supplying 60,000 B.t.u.h. and one supplying 80,000 aver-

(Concluded on Page 11, Col. 1)

$15 Million In Orders Placed With Airtemp

DAYTON—Chrysler Airtemp distributors ordered more than $15 million worth of air conditioning and heating equipment during the company's three-day National Business Conference early this month.

This figure is larger than the company's sales for the entire year to date, according to Joseph B. Ogden, vice president in charge of sales.

During the conference, Paul M. Augenstein, Airtemp president, declared that expansion and growth of all air conditioning and heating lines is Airtemp's goal for the future. He predicted a record year in 1959.

He indicated that for 1959 there will be five basic room air conditioner models, making perhaps a dozen models in all variations. There will be some increase in packaged units.

Details on the new products will be published by the NEWS as soon as complete details are available.

Highlight of the business conference was the signing of Stahl & Myers Air Conditioning Co. of Houston, Texas as an exclusive Airtemp dealer. Last year Stahl

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Fedders First Quarter Shipments Up 53% over Same Period Last Year

MASPETH, N. Y. — First-quarter shipments of Fedders air conditioners set a new record and were 53% greater than last year's record first quarter, Fedders-Quigan Corp. stockholders were told at the firm's annual meeting last week.

Preliminary figures on first-quarter operations also indicate a slight increase in sales and almost a doubling of income, according to Salvatore Giordano, president and board chairman.

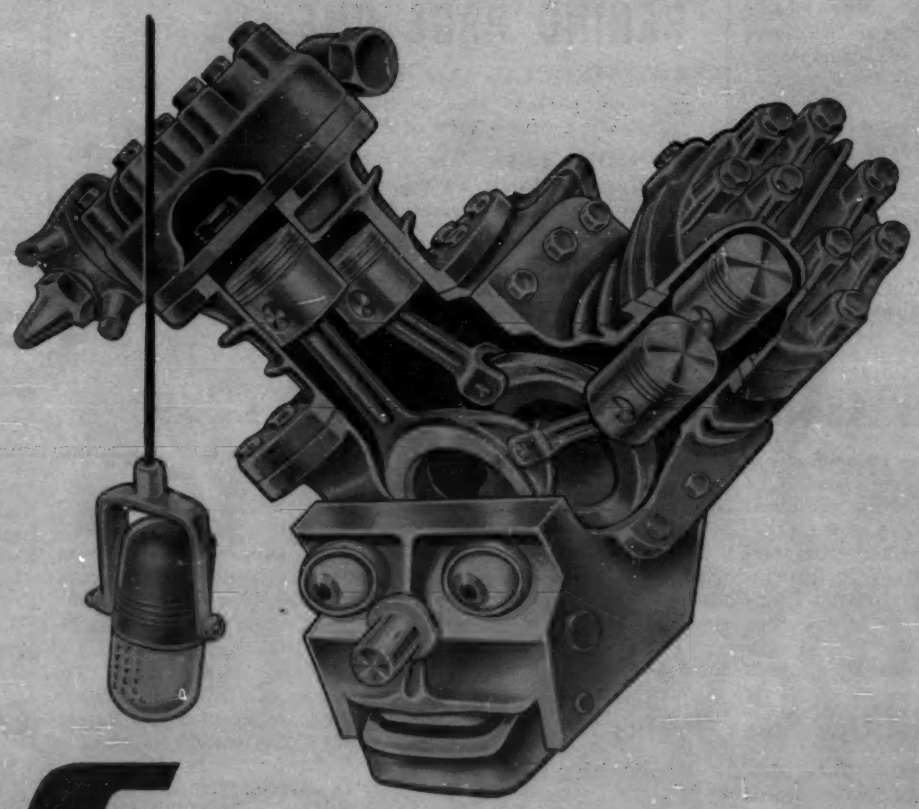
Giordano said the great rise in Fedders unit shipments more than offset the loss of contract business which existed during the first quarter of the year. As a result, the firm was able to operate at a much greater profit at just about the same level of sales. Contract sales in the past have been concentrated in the first half of each fiscal year.

Among the factors contributing to the increase in Fedders shipments was the greater popularity of heat pump air conditioners, according to Giordano. These heating and cooling units, which were introduced on a large scale during last year's first quarter, are being purchased by consumers as winter heat sources, he noted. Another sales spur, he added, has been the anticipated expansion of the 10% Federal excise tax to all room air conditioners.

Fedders earnings for the first quarter of the 1959 fiscal year ended Nov. 30, 1958, should be about $940,000 against $500,673 for the corresponding quarter of the previous fiscal year.

Net income after taxes, Giordano told stockholders, should be in the neighborhood of $420,000 or about 20 cents per share on the currently outstanding common stock, after the preferred dividend, as against $225,000 or 11½ cents per share, calculated on the same basis, for the previous fiscal year's quarter. Sales for the quarter, Giordano said, should be around $10,500,000 as against $10,100,000 a year earlier.

The stockholders voted to amend the certificate of incorporation to change the name of Fedders-Quigan Corp. to Fedders Corp. The change was deemed advisable in the interest of simplifying the corporate title and to associate the overall company name more closely with the Fedders brand.



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...it would boast of its ability to perform at peak capacity as part of an efficient Thermobank system free from the troubles of a liquid-loaded compressor with its foaming and lubrication problems and without the strain of overloading conditions. It would point out to compressors new and old that Thermobank has met the test of many years during which time other systems have come and gone and taken compressors with them.*

** Prize winning copy in Kramer Thermobank contest submitted by Earl T. Evans, Glen Keller Corp., 1436 West 25th Street, Cleveland 13, Ohio*

For Additional Information Write For Bulletin TC-406

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AND NOW SEE THE NEW KRAMER FACTORY-PACKAGED THERMOBANK COMPRESSOR SYSTEM

Amana Sets Up Room Conditioner Div., Names Wes Brient

AMANA, Iowa—Wes Brient has been appointed product manager of the newly-formed room air conditioner division of Amana Refrigeration, Inc., it was announced by Walter Wendler, vice president.

Wes Brient

This appointment marks a greater emphasis on the part of Amana into the room air conditioning field, and will permit a greater concentration of the company's manufacturing, engineering, and marketing facilities into this area, the announcement said.

Brient was formerly vice president of Vornado Distributing Co. in Kansas City.

Latch Law Covers Only Household Refrigerators

DETROIT—The new Federal law that took effect Oct. 30 requires inside opening devices only on *household* refrigerators in interstate commerce, it was pointed out here recently in answer to an inquiry from the field.

In reporting the story, the NEWS had not specified household refrigerators.

"I AM FRANKLY AMAZED AT BENDIX-WESTINGHOUSE"

"When we switched to Bendix-Westinghouse, we were amazed at the reduction in our compressor failures."

So wrote Mr. Chester A. Kuebler, President of Uniflow Manufacturing Company, after using several thousand of our condensing units. Uniflow manufactures a wide range of quality refrigeration products, demanding a high degree of satisfaction among many different types of customers.

Mr. Kuebler also tells us, "We are very happy with the fine service we have received from your company."

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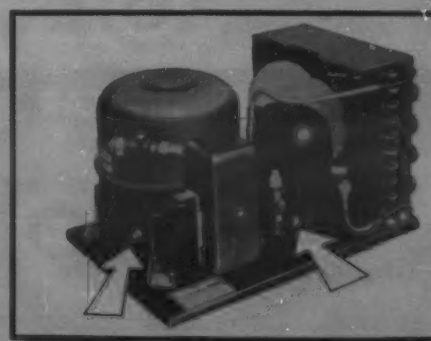

Liquid level test port (Arrow No. 1) for fast, accurate assurance of right refrigerant charge. (Arrow No. 2) Oil level check plug—for fast, accurate check of the compressor oil level. A typical example of superior Bendix-Westinghouse design.

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Carrier Names Kehoe, Meling

SYRACUSE, N. Y. — Burton T. Kehoe has been named sales manager of packaged air conditioning equipment for the Unitary Equipment Div. of Carrier Corp. by Russell Gray, company vice president and general manager of the division.

B. T. Kehoe

A. E. Meling

Gray also announced the appointment of Arthur E. Meling as manager of technical services.

Formerly assistant to the general manager, Kehoe will now be in charge of air conditioning and heating equipment for both residential and commercial application.

Kehoe is presently administrative manager of United Engineering of Miami, and a director of Air Conditioning Corp. of Louisville, Ky.

Meling's position is a new one created to emphasize customer service by combining responsibility for application engineering, product service, and service parts in one department, it was explained.

Formerly manager of the Weathermaker department, Meling's new duties include direction of technical services and a major assignment in the product planning activity of the division.

Logan Foundation Establishes $500 Annual Scholarship

SAN LUIS OBISPO, Calif.—Establishment of an annual $500 scholarship at California State Polytechnic college by the Hugh H. Logan Foundation of Glendale, Calif., has been announced here by Dr. Julian A. McPhee, president of the college.

The scholarship is to be awarded each spring to a student at the college planning to enter the field of air conditioning, heating, or plumbing.

The award is to be made in the spring of the recipient's junior year for use the following year. Faculty members in the air conditioning and refrigeration engineering department may recommend candidates for the award.

Boosting Assn. Attendance

Miami Secretary Tells How His Group Gets 85% Attendance at Breakfast Meetings

MIAMI, Fla.—How can an organization get its members to come out to meetings? When is the best time to hold them?

Those are questions that came up specifically at two industry association conventions here recently.

Unfortunately, the man who apparently has an answer did not appear at either one of them.

He is Howard Davis, secretary of the Air Conditioning & Refrigeration Association of Miami.

"We will hold breakfast meetings at 7 a.m. on every second Thursday of the month in the McAllister hotel in downtown Miami," Davis declared. "The hotel opens up the dining room for us.

"At 7:30 a.m., the meeting starts, giving those who don't want to eat breakfast with us a chance to arrive. At 8:59 a.m. the gavel falls and the meeting is over.

"We have been doing this very successfully for a year and a half now. We get 85% of the membership out to the meetings, which is extremely good.

"At this hour in the morning, the men are fresh, they conduct their business briskly, and they are in their offices with little time lost."

Timing of company sales meeetings was broached in a question period at the convention of the National Commercial Refrigerator Sales Association.

Ray Greene, sales manager for Tyler Refrigeration Corp., suggested that Friday morning was a good time. Men are more rested and alert then.

But, he said, it depends on what you are trying to accomplish. A special purpose meeting, such as a year-end meeting, might better be held in the evening.

George N. Eskra, executive vice president for the Ray Winther Co., San Francisco distributorship, commented that his company holds its meetings on Tuesdays from 6 to 8 p.m.

"It's not because we think it is the best time," he said, "but it is the time that most salesmen can conveniently make it."

7 Suggested Spurs

At the National Association of Practical Refrigerating Engineers convention, Educational Chairman Guy R. King opened up a discussion on the best methods of getting members to come out to meetings.

Suggested methods were to

- Hold consecutive educational meetings so that there would be a continuity from meeting to meeting,
- Get local licensing officials into the chapter,
- Keep business meetings brief,
- Hold an entertainment for wives once or twice a year (on the theory that they would encourage their husbands to attend meetings regularly),
- Get young members to participate in chapter activities,
- Work to eliminate divisions of interest within chapters (such as between adherents of ammonia and "Freon"),
- Have the chapter participate actively in community affairs pertaining to refrigeration (such as revisions of local codes, safety drives, cooperation with other societies, etc.).

WOLVERINE SERVES THE REFRIGERATION INDUSTRY...

See Wolverine's exhibit at the 14th International Heating and Air Conditioning Exposition, Philadelphia, Pa., January 26-29.

WITH LIGHT WALL COMMERCIAL COPPER TUBE

Light wall commercial copper tube manufactured by Wolverine Tube provides refrigeration and air conditioning manufacturers with the answer to two problems: ECONOMY and SERVICE.

Because of its thinner walls, this tubing is lighter in weight—gives more tubing per pound. Because it is the product of Wolverine Tubemanship, it provides maximum service with top performance. Wolverine light wall commercial copper tube is clean, bright and dry—is rigidly quality controlled to insure wall thickness and diameters that meet the toughest specifications. It is available in straight lengths and coils in light annealed, soft annealed, and standard drawn tempers of ¼ hard, ½ hard and full hard. Special tempers are also available.

Illustrated below are other products Wolverine Tube manufactures and fabricates for refrigeration and air conditioning use. You can specify all—or any—secure in the knowledge that no finer tubing is made. For more information write for our new book Wolverine Serves the Refrigeration Industry. Do it TODAY!

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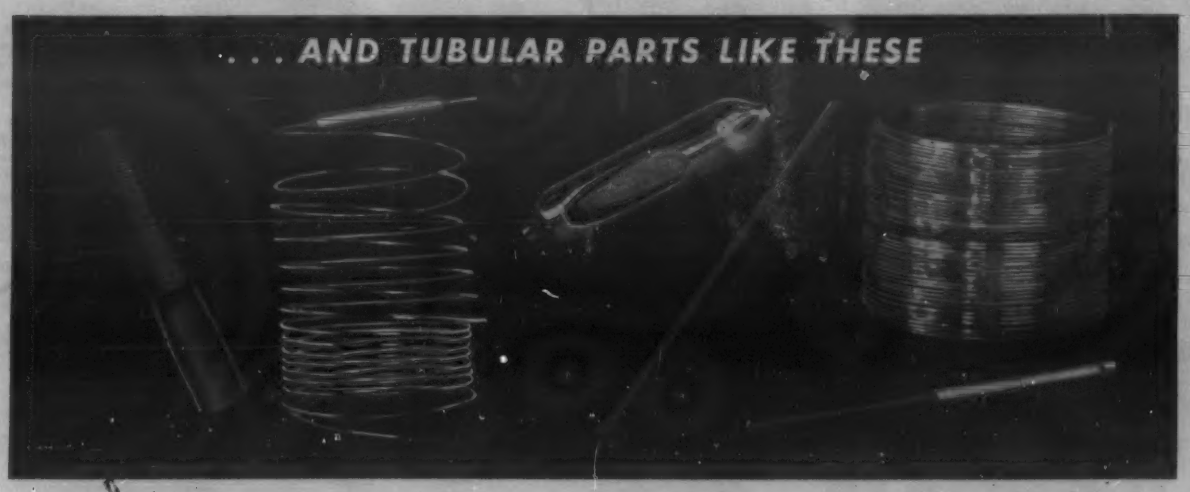

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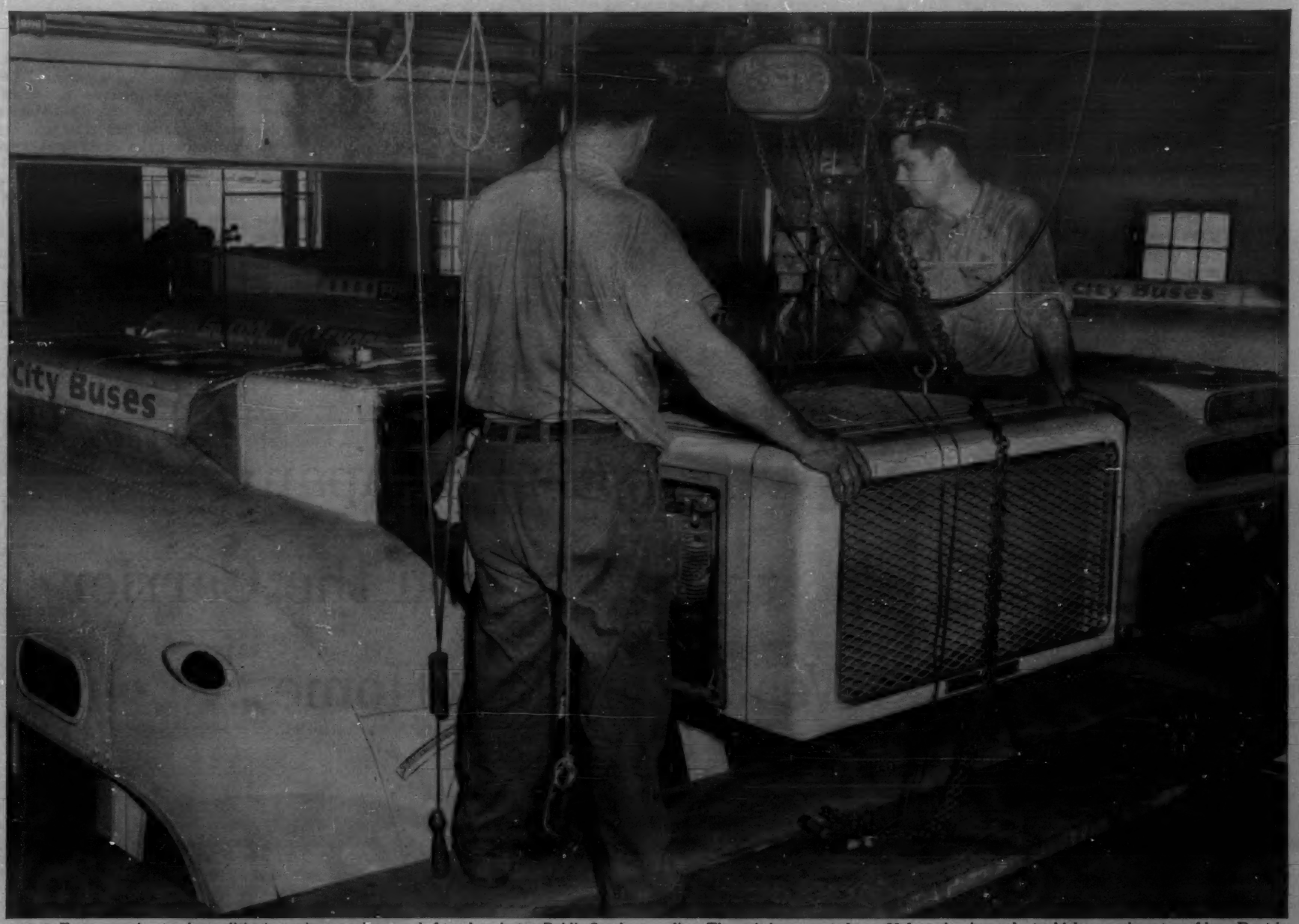

ABOVE: For conversion to air conditioning, a bus usually spends four days in the Public Service Company workshop and two days in their paint shop. Work starts with removal of back roof section of bus. Steel braces are fitted in the opening to support air conditioning unit. A compact 7-ton Thermo King package unit charged with "Freon-12" is mounted in the rear to provide cooling. The unit is connected to a 23-foot aluminum duct which runs along top of bus. Duct is insulated inside with a one-inch thickness of fiberglass. Seams are sealed with adhesives making entire system water- and air-tight. Converted bus is then ready for painting. All parts of system fabricated at the shop are interchangeable for use on all Public Service Company buses.

How to add air conditioning to a city bus

Addition of 7-ton, Freon*-charged systems to 140 St. Louis buses blueprints economical method for conversion of any bus

To boost summer business on express lines, the Public Service Company, St. Louis, Missouri, recently converted 140 buses to air conditioning. The company engineered the systems and installed them quickly and economically using 7-ton Thermo King package units.

Thermo King units were designed for truck refrigeration, but because they are small, compact and deliver high cooling capacity, they proved ideal for city-bus air conditioning. Converting a bus to air conditioning takes about six days at a cost of approximately $3,000.

Air conditioning helped increase business on Public Service Company's express buses in spite of declining travel on their other lines. Air conditioning systems are charged with "Freon-12" and have provided trouble-free performance.

Bus air conditioning is an example of a profitable market that might be developed in your city. For every market, for every job, be sure the equipment you install is charged with "Freon" refrigerants to help assure safe, trouble-free performance. Specify "Freon"—now in new gold-capped cylinders. Gold identifies the *premium* quality of "Freon" . . . factory-sealed for purity by Du Pont. *E. I. du Pont de Nemours & Co. (Inc.), "Freon" Products Division 1010, Wilmington 98, Del.*

ABOVE: Four outlets are installed in the ceiling, equally spaced from front to rear. Outlets are baffled to permit distribution of cool air to the coach interior without drafts. A fresh air intake grille is located on roof near the front of the bus.

AT RIGHT: Thermostatically controlled cooling system maintains 70-degree temperature in 40-passenger bus. System is started by driver at beginning of his run, and from then on it works automatically, powered by its own gasoline engine.

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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Supermarkets Are Biggest Cooling Customer In Retail Field—Petrone

MIAMI BEACH, Fla.—More money will be spent this year for air conditioning in supermarkets than any other segment of retail business, Don V. Petrone, president of Typhoon Air Conditioning Co., Div. of Hupp Corp., informed commercial refrigeration distributors convening here.

Speaking at the 12th annual convention of the National Commercial Refrigerator Sales Association, Petrone predicted that 1959 "should be a tremendous year for the sale of air conditioning equipment to modern supermarkets. But to sell profitably, we must sell smart and give the customer the right kind of equipment to do a proper job."

He contended that commercial refrigerator distributors were already organized to go after this market.

Revolutionary Changes

Petrone declared that in the past five or six years, air conditioning for supermarkets has undergone some revolutionary —if not dramatic—changes.

"The public is not aware of the technological advancements made by our industry in this specialized field over the past few years," he asserted. "And, from my personal experience, I must add that many air conditioning contractors have not kept abreast of the times.

"Not too many years ago, we were all recommending that water-cooled packaged units be installed on the floor in the sales area of a market, and the unit with the least requirement of floor space obviously had the greatest sales appeal to the market operator.

"Considering the buyers' objection to giving up any valuable floor space, the next step of progress was to split the air conditioner into a low-side unit which could be bolted to the wall or suspended from the ceiling, and a water-cooled high-side section that could be located in the basement, rear storage area, or on the roof.

"This approach temporarily met the buyers' objection to lost floor space in his sales area. But about this time, the shortage of water was becoming a problem of national concern and many cities passed legislation taxing the big users or imposing restrictions on the unlimited use of water for air conditioning and refrigeration.

"You contractors met this problem by adding a water saving device to your new installations, and—in most cases—you went back and sold them to all of your earlier customers. The die was cast, however, and the trend to air-cooled installation had its origin at this point.

"The typical market at this stage of the development might have been equipped with multiple air handling units suspended from the ceiling in the sales area, and connected by piping to remote air-cooled units on the roof.

"The buyers ultimately raised some new objections; first, they objected—in some cases—to the appearance of the roof-mounted air-cooled high sides, and again —in some instances—they expressed a preference to larger sized air units in the rear storage area with ductwork rather than multiple air units in the sales area.

"To answer the first objection, it was necessary to either move the air-cooled condensing units down to the ground level or install them inside the building shell.

"The latter proved to have some latent advantages in that the blowers on the air-cooled high sides could be utilized to pull air through the condensers of the commercial refrigeration units and exhaust this air outdoors.

"This eliminated the need for a separate exhaust system to relieve the summer temperatures in the machine room. The air conditioning high sides had to be sized to do the job of cooling while handling a higher temperature entering air to the condenser, but the advantages of this method are quite apparent.

"Moving the air units to the rear storage area presents no major problem, except that sheet metal costs increase. Recently developments would indicate, however, that some major chains are ready to try insulating the wall and roof area above the suspended ceiling and use that space as a plenum chamber for air distribution, and thus eliminate extensive supply duct systems.

"This brings us up to the

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that gave you the Carrier

Weathermaker Home...

NEW Carrier

THERMO-CENTER

saves hundreds of dollars

on the cost of new home

air conditioning!

Phone your Carrier Distributor for complete details,
or write: Carrier Corporation, Syracuse, New York.

present moment in the modern supermarket which is in the drawing board stage of planning. Realizing that all of the previously described systems have been developed in the last five or six years, it is apparent that supermarket air conditioning has not been a static science.

"The contractor who has consistently rung up profits in this field of endeavor is one who has:

"1. Kept abreast of the merchandising trends in supermarkets.

"2. Maintained an up-to-the-minute knowledge of developments in equipment available for modern supermarket air conditioning.

"3. Kept an active interest in advancement of his subcontracting trades such as sheet metal including the new type of grilles and outlets available, plumbing, rigging, and wiring, and who has . . .

"4. Continually planned ahead for his next market air conditioning job — never allowing himself to be satisfied with the last job, but continually revising and refining to answer buyer objections, and increase the over-all utility of the air conditioning system without increasing the cost to the purchaser, and

"5. Made certain that flexible — quality engineered products were available to him to fulfill each and every job requirement.

"The contractor who has kept his organization flexible in their thinking and selling methods, and up-to-date in relation to the five points just mentioned, is one who has some good numbers to read below the line of his profit and loss statement.

"Believe me when I say that the buyers' emphasis today is *not* the cheapest price, but rather where can I get the most *value* for the dollars I must spend.

"This attitude is particularly true with supermarket buyers who—as a class—are generally considered to be among the top purchasing agents in the country.

"Therefore—if your engineering is up to the minute and you back up your sales department with a well-managed, capable service and installation crew—don't be hesitant in adding your normal profit to each supermarket air conditioning estimate.

"You will get your share of the jobs and your reputation will precede you in making calls on supermarket buyers.

"They are seeking alert, aggressive companies because their common complaint is that they have had to do much of the progressive thinking themselves when it came to store equipment planning and layout.

"You will find them eager to turn the design problems of future stores over to you once you have shown them the capability of your organization.

"In 1958, $635,000,000 will be spent on supermarket construction and modernization. This means that more money will be spent for air conditioning in supermarkets than any other segment of the retail business.

Over 3,000 Were Cooled During 1957

"This potential is greater than most of us realize. In 1957, over 3,000 supermarkets were air conditioned at an expenditure of $40,500,000. Present indications show that they will exceed this expenditure in 1958.

"In 1956, the average new supermarket was about 10,000 sq. ft.—but today it is quite commonplace to hear of many supermarkets being built with floor areas of 20,000 to 30,000 sq. ft.

"During the past year, we have heard of several markets in the 60,000 to 70,000 sq. ft. category, requiring 200 to 250 tons of air conditioning in each market.

Potential Growing

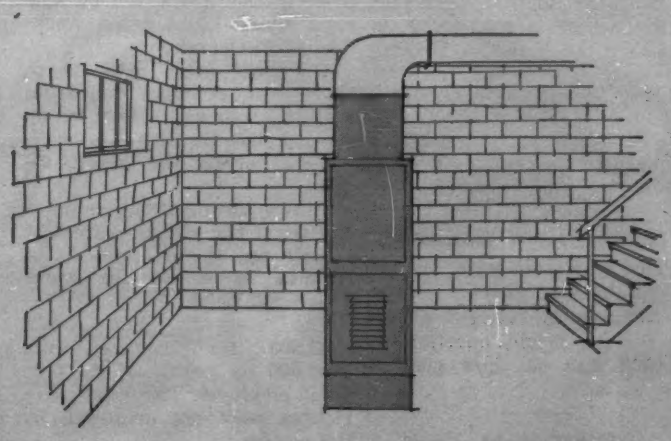
"Air conditioning equipment requirements for these supermarkets is ever on the increase and the potential for sales in this field keeps growing and growing.

"With the food business definitely on the uptrend, supermarket operators are also becoming much more aware of the important role played by efficient air conditioning equipment in their stores.

"When it comes time for expansion plans or additions to existing stores or remodeling, they will naturally think of the dealer or contractor who has in the past performed efficient installations for them and has been most reliable when service was required.

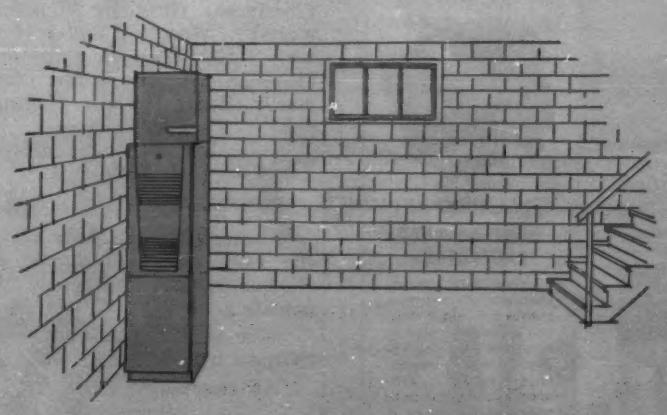
"As for expansion plans in the supermarket field, a recent survey of six of the largest supermarket operators showed they have over 900 new markets planned for 1959.

"I would like to mention that supermarket maintenance supervisors and construction department heads have begun to realize more than ever before the many advantages of installing proper equipment in their stores. They want equipment which will give them top efficiency at a low maintenance cost.



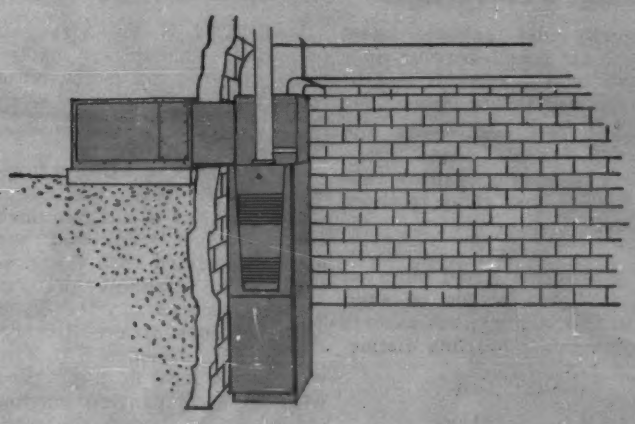
1. *GONE ARE THE DAYS...*

when the furnace was planted in the middle of the basement. That was good enough when people were satisfied with heating only. But today they want air conditioning, too — and they want it at low cost.



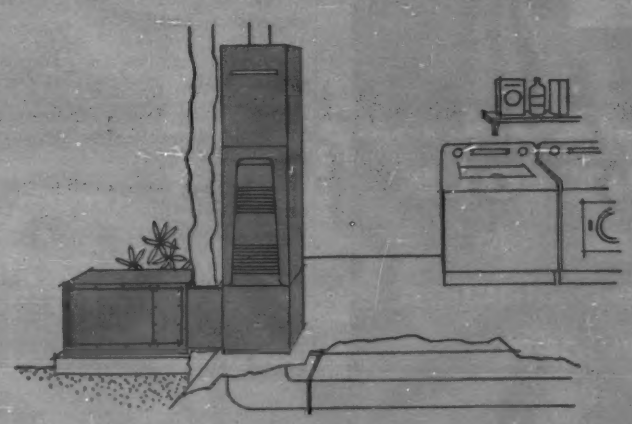
2. *SO CARRIER MOVED THE FURNACE...*

from the center of the basement over against an exterior wall. Now, the way was opened for a new kind of year-round air conditioner: the Carrier Thermo-Center which costs hundreds of dollars less than conventional systems.



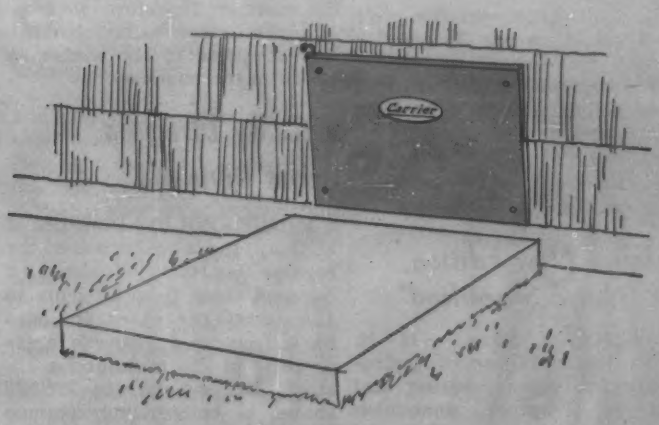
3. *IN A HOUSE WITH A BASEMENT...*

a plenum is set on top of an upflow Carrier Winter Weathermaker. A short duct goes through the wall, connecting the plenum with the cooling section located just outside. No water or refrigerant piping is required.



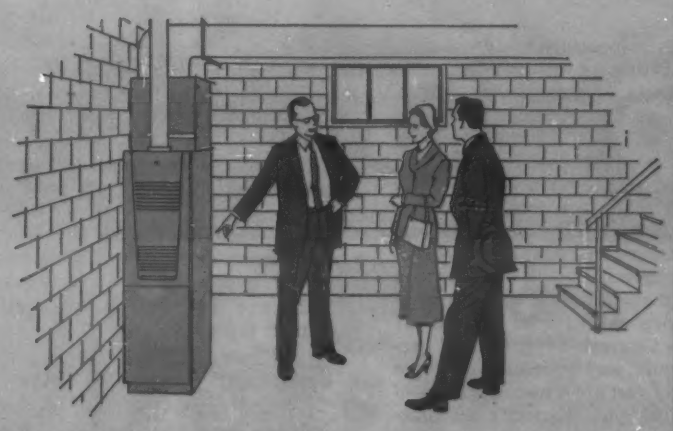
4. *IN A MODERN SLAB HOUSE...*

a plenum is placed underneath a downflow Carrier Winter Weathermaker. Then the same procedure is followed. A short duct through the wall connects the plenum with the cooling section located just outside. Quick, simple, easy!



5. *THE OPTION IS YOURS*

You can install a complete Carrier Thermo-Center when the house is built. Or omit the cooling section. Carrier provides a metal cover for the wall opening which reminds the home owner how easily he can add cooling later.



6. *EITHER WAY YOU GO...*

the Carrier Thermo-Center enables your salesmen to talk to their prospects about the many year-round benefits of home-wide air conditioning. They can have it now or add in the future — either way at unbelievably low cost.

Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

"I shot an arrow into the air, and hit pop right in the underwear."

Sober Note

We should remember that it was a Jew who wrote, "The Lord is my shepherd, I shall not want."

It was an Episcopalian who wrote, "O Little Town of Bethlehem." Martin Luther hymned "A Mighty Fortress Is Our God."

It was a Presbyterian who composed "Rock of Ages." A Catholic wrote "Silent Night."

If we can share our hymns with one another, we should be able to compose our doctrinal differences.

KLIXON
DOME MOUNTED PROTECTORS
. . . develop all the safe capacity available in hermetic compressors under overload conditions . . . shut the motor down when maximum allowable winding temperatures are reached . . . automatically restart the motor when operation can be resumed safely.
KLIXON
MOTOR STARTING RELAYS
. . . complete the combination required to start and protect compressor motors. Their positive action and long life eliminate starting troubles.
KLIXON
SEALED THERMOSTATS
give reliable temperature control . . . unaffected by altitude or cross-ambient temperature. They are available for automatic or manual reset operation in heating or cooling applications.
KLIXON CONTROLS
3 steps to trouble-free protection and dependable refrigeration

KLIXON Refrigeration Controls help assure optimum performance and dependable operation of air conditioners, refrigerators, frozen food cabinets, water coolers, deep freezers and other refrigeration equipment under favorable and difficult conditions.

These controls . . . KLIXON Dome Mounted Protectors, KLIXON Motor Starting Relays, KLIXON Sealed Thermostats . . . are widely used by leading manufacturers to develop maximum, safe hermetic compressor performance regardless of operating conditions, and to assure long life. They protect overloaded compressors from dangerous motor overheating, start motors efficiently again and again over a wide range of line voltage variations, and keep refrigerated equipment frost-free. KLIXON Refrigeration Controls save, too, by preventing compressor motor burnouts, and by reducing service calls, repairs and replacements. If you are a manufacturer of refrigeration equipment, it will pay you to specify compressors with KLIXON Controls. Check with your compressor supplier . . . or, we will gladly send literature on request.

METALS & CONTROLS CORPORATION
Spencer Division 2412 Forest St., Attleboro, Mass.
KLIXON

All People Smile In The Same Language

God Jul (Swedish). Feliz Natal (Brazilian). Glaedelig Jul (Danish). Joyeaus Noel (French). Bona Natale (Italian). Boas Festas (Portuguese). Hauskaa Joulua (Finnish). Hartelyke Kerstgroeten (Dutch). Kung Hsi Hsin (Chinese). Felices Pascuas (Spanish). Nosteria Lui Christ's Sa Va Die De Felos (Rumanian). Prijemme Svatky or Vesele Vanoce (Czech). Froehliche Weinachten (German). Kala Christougenia (Greek). Christmas O-medeto (Japanese). Glaedelig Jul (Norwegian). Wesolych Swiat (Polish). S. Rozhdestvom Chirstova (Russian). Sretan Bozoic (Serbian). Merry Christmas (English).

They'll Get You Every Time

"Father, did you hear about the baby that was nursed on elephant's milk, and gained five pounds a day?"

"Wha-at?," sputtered Pop. "Whose baby?"

"An elephant's."

Unable to find her usual dime, Mama gave Christy a quarter for the Sunday School collection plate.

Christy, aware of the effect of inflation on ice cream and candy, queruloused:

"Mum, has church got more expensive, too?"

Fondly grandma listened while Billy said his bedtime prayer.

"Well done!" she congratulated.

"Ah, that was nothing," Billy deprecated while piling into bed. "You should hear me gargle."

Problems of Parenthood

"Do you believe in the Devil?"

"Nah. It's just like Santa Claus. He's your father."

A. Pryor of the *Grosse Pointe News* reports a pre-Christmas department store scene in which three small children of an harassed young mother got into a whing-ding of a fight.

"Go ahead, kill yourselves off," the young mother cried out. "Then I won't have to spend so much on Christmas presents."

"It's no trouble to get my boy out of bed in the mornings," boasted a mother. "I just toss the cat into his bed."

Another mother didn't get the drift.

"He sleeps," elucidated the first mother, "with his dog."

It was time to go to church. Mother's arms were full of coats and hats, but she just stood there while her five small children milled around.

"Come on, come on, get a move on," impatiented Father.

"No," she stood her ground. "This time you wrestle them into their coats while I go outside and honk the horn."

Not so many kids are running away from home these days. The average TV set is too heavy to carry.

Father of a teen-age miss exasperatedly had a phone installed just for her. Catching her talking over HIS telephone, mildly he asked, "How come?"

"Gee, Dad, don't be such a square," she withered. "Somebody might want to call me on mine."

You Can't Lick 'em

The trouble with our school system today is: teachers are afraid of principals, and principals are afraid of the superintendent.

The latter, in turn, is afraid of the school board, which is afraid of the parents. Parents are afraid of their children; but children are afraid of nobody.

"If a Good Fairy gave you two wishes," prompted one little girl to another, "what would they be?"

"I'd wish for a husband."

"That's only one wish," pointed out the first girl.

"I'll save the second wish," savvied the bright questioneer, "until I find out how good a man he is."

"My father is an Eagle, a Moose, an Elk, and a Lion," boasted a junior-high youngster.

"Yeah?" gasped his buddie. "How much does it cost to see him?"

The TV Western Effect

Proudly did Johnnie show mumsy his pencil drawing of a cowboy in a saloon. It had to be explained to her, natch.

"Don't feel bad about the saloon," Johnnie added. "My cowboy isn't going to drink anything. He's just going to shoot a man."

It is said we spend more on wild life than we do on child life in this country, but parents will find this a puzzling distinction.

Little Fiends Dept.

Mary heard her daddy say he was going to entertain some of his friends at a home beer party.

So she nailed the bathroom door shut.

"Where is the English Channel?"

"I don't know, teacher. We can't get it on our TV set."

In a supermarket Bobbie tried to be helpful. He brought Mom a package.

"No, dear, go put it back," she shuddered. "I'd have to cook that one."

Release New Edition Of 'Noise Simplified'

MAYNARD, Mass. — H. H. Scott, manufacturer of instruments for the measuring and analysis of sound, announces the release of a new edition of its booklet "Noise Simplified," by Victor H. Pomper.

This pamphlet has proven helpful to design engineers in their efforts to design quieter products, it was stated. Copies are available free by writing to H. H. Scott, Inc., Dept. P, 111 Powdermill Rd., Maynard, Mass.

Ammonia Didn't Cause Blast— Virginia Jury

RICHMOND, Va.—A Virginia jury has decided that escaping ammonia refrigerant did not cause the blast that wrecked a five-story refrigerated warehouse here last January.

They accepted the owners' contention that escaping gas from a city main set off the blast which killed seven workmen in the warehouse.

The jury, after listening to 16 days of testimony and deliberating seven and a half hours, decided that the city was negligent in letting the gas to escape.

Jurors awarded the families of four of the victims a total of $60,000 and the Atlantic Co. of Atlanta, owner of the warehouse, $251,000.

The company had asked $502,389 for damages and $100,000 on behalf of its four killed employes. The other three victims were not employed by the company.

A lawyer for the city of Richmond said he would file a motion to have the jury's decision set aside.

Santa Sells Fedders Room Conditioners

MASPETH, N. Y.—A factory prepared Christmas display piece designed to merchandise room air conditioners is being made available to Fedders dealers.

The display consists of a four-color, die-cut cardboard Santa Claus that has a self-contained easel. Santa's traditional toy bag is imprinted with the message: "The grandest gift I'm giving this year . . . Fedders heats and cools air conditioner."

The Santa measures 3 ft. 3 in. wide and 4 ft. 9 in. high. Used with an accompanying window streamer that carries the same message, the unit is suited for a dealer's window or display floor, it was noted.

Said Harold Boxer, advertising manager, Fedders-Quigan Corp.: "It's not really selling refrigerators to the Eskimos. Our heat pump air conditioner heats in the winter as well as cools in the summer, Therefore, we have as much reason to merchandise and advertise in the winter as we do in the summer."

McQuay Directors Boost Dividend

MINNEAPOLIS—Directors of McQuay, Inc. have increased the regular quarterly dividend on common stock from 10 cents to 12½ cents per share and also have declared a year-end extra dividend of 7½ cents and a 3% stock dividend on its 286,532 shares of outstanding common stock.

In addition, McQuay has declared the regular quarterly dividend of 25 cents per share on the company's 14,123 shares of outstanding 5% cumulative preferred stock of $20 par value. The dividends are payable on Jan. 2, according to the firm's announcement.

Electronic Tube Testing Equipment

HUMAN ERROR in spotting hidden defects and flaws in copper tubing is reduced to a minimum by Kensico's triple-action Electronic Tube Tester, shown here in tandem with a Torrington Roll Straightener.

* * *

Kensico Unit Spots Flaws Invisible To Human Eye

MOUNT KISCO, N. Y.—Flaws in copper tube impossible to detect with the human eye are picked up by each of five electronic testing units mounted on the production lines of Kensico Tube Co. here.

Developed by Kensico—which is also supplying them to other tube manufacturers—the electronic testers operate on eddy current principles. Essentially, symetrically placed coils respond to any change in conductivity of the copper tube passing by them. Flaws, therefore, will show up as a meter deflection, audio, or visual signal—whichever is chosen.

Equally important, a built-in marking relay makes it possible to mark the exact location of defects and flaws.

The units supply variable test frequencies between 500 and 16,000 cycles, thus allowing enough adjustment in sensitivity to test through the tube wall or just on the surface, or anywhere between. A blanking adjustment allows point and sink marks to pass without being mistaken for flaws in the tube.

Kensico's engineering staff, in addition to developing the electronic tester, has designed and built its own variable speed bullblock for tube drawing, and it has laid out a plant with draw benches sunk completely underground—making possible "a continuous flow of material and eliminating need for separate handling, particularly of long tube lengths," according to the company.

Fairly new as a copper tube supplier, Kensico produces several hundred sizes of tube, from 0.036 in. to 2⅝ in., the company states. "In the ten-year period of present management, there has been an increase in production capacity to more than 1,000,000 lbs. per month," reports Thomas Nast, president of Kensico.

"Corrosion." By Frank J. Versagi—50¢ each.

Get your copy — Mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

Brochure Illustrates Uses and Provides Installation Data on Transite Ducts

NEW YORK CITY—Complete diagrams and self-explanatory pictures for installation of Transite air duct for modern perimeter heating and cooling systems are presented in a new brochure released by Johns-Manville Sales Corp.

Included is detailed information on the different kinds of heat-systems for slab-on-grade homes without basement and multi-level homes.

The brochure points out how Transite air duct combines quality work with maintained profit margins, how there is no need to encase it in concrete. Emphasis is placed on the fact that the duct doesn't have to be tied down or held up, and on Transite's long sections, readily laid to grade. Although Transite is lightweight and easy to handle, attention is called to its durability. (Storage is no problem. It can be stacked without danger or deformation and can be stored outdoors without fear of weather damage).

Actual on-the-job photos in the brochure show the three main systems, loop, radial, and lateral, as they are being installed. This brochure gives the concise story of the principles of perimeter heating and how, by planning and proper design, the basic perimeter heating system can provide for summer cooling, making it a dual service.

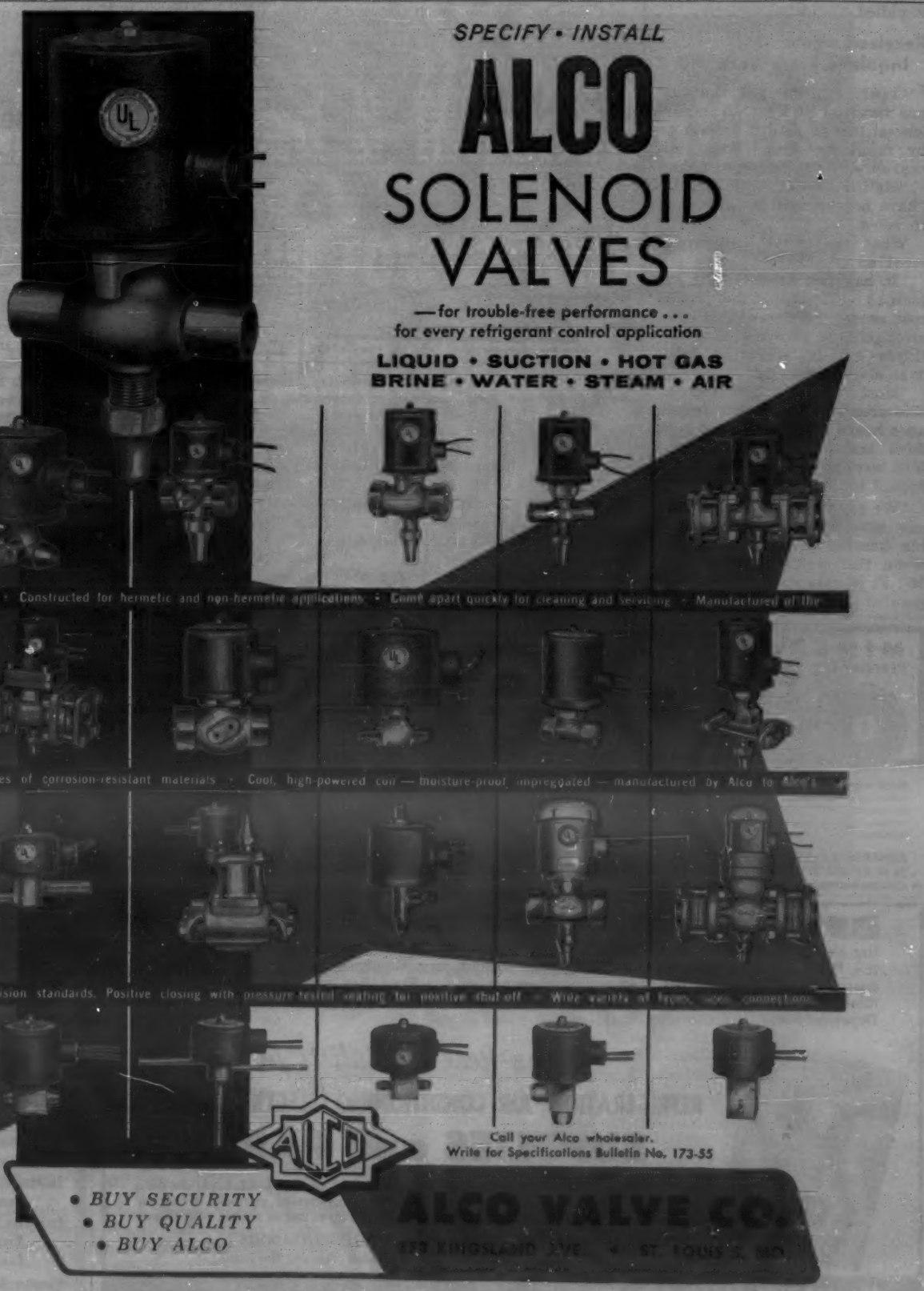
A guide for installing Transite air duct based on FHA and NWAHACA recommendations is also included. Details of site preparation, under-slab preparations, installation, installations of the moisture barrier, preparation of joints and Transite fittings, give a complete picture of its application.

Photographs show various ways Transite can be cut on the job, and how fittings can be made easily with pre-cut segments.

Ohio Store Fixture Holds Open House

BATH, Ohio — Ohio Store Fixture Co. here, distributor of The Bastian-Blessing Co., held an elaborate three-day "Open House" Nov. 24-26.

The company recently moved into its own new building at 2236 Cleveland-Massillon Rd. on Route 21, where it operates what it calls a "supermarket type" distributorship of equipment and appliances.


SPECIFY • INSTALL
ALCO
SOLENOID
VALVES
—for trouble-free performance . . .
for every refrigerant control application
LIQUID • SUCTION • HOT GAS
BRINE • WATER • STEAM • AIR
Compact • Constructed for hermetic and non-hermetic applications • Come apart quickly for cleaning and servicing • Manufactured of the
best grades of corrosion-resistant materials • Coil, high-powered coil — moisture-proof impregnated — manufactured by Alco to Alco's
high precision standards. Positive closing with pressure-tested seating for positive shut-off • Wide variety of types, size connections
Call your Alco wholesaler.
Write for Specifications Bulletin No. 173-55
• BUY SECURITY
• BUY QUALITY
• BUY ALCO
ALCO VALVE CO.
7803
The one complete line of refrigerant controls: Thermostatic Expansion Valves • Refrigerant Distributors
Solenoid Valves • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves

Knoxville Distributor Capitalizes on Interest In Heat Pump by Emphasizing Economy In Ads

By George M. Hanning

KNOXVILLE, Tenn.—A hidden vein of strong consumer interest in heat pumps has been uncovered in this area by E. B. Copeland, president of Copeland & Co., distributor of Fedders "Adaptomatic" heat pumps.

"This thing has taken us by surprise," Copeland declared. "We didn't know the consuming public is as receptive to heat pumps as it has proved to be this year."

Copeland jabbed for the vein last May with the advertisement pictured here. Response was instantaneous. He repeated it with good results again.

"We ran this ad at least 20 times last summer. Every time it pulled.

Received about 15 Inquiries From Each Ad

Copeland estimates that he has received at least 15 inquiries—either by return coupon or by telephone—from every appearance of the advertisement.

"Half of these," he estimates, "have been or will be converted to sales."

What makes the advertisement so effective?

"It has two appeals," he explained. "First the low initial cost saving promised, and even stronger, the prospect of a two thirds cut in operating costs over electric heating.

"Most new construction in this area is with electric resistance heating. We had some cold days last winter and heating bills were high. So the economy appeal hit home.

"We say the heat pump owner can save up to two thirds on his heating bill. He will, too, when the temperature is over 35° F. In this country the temperature is higher than that for more than half the winter.

"When the temperature is over 35° F. the heat pump will take care of the heating load by itself. So all the power it requires is that needed to run the 2 or 3-hp. compressor motor and the fan motor. This is far less than what it takes to provide an equivalent amount of resistance heat.

"When the temperature falls below 35° F., we, of course, require supplemental heat. Naturally the more supplemental heat required, the less the saving. But there is still a substantial saving possible."

To follow up on heat pump sales, Copeland has assigned David Peltier as Adaptomatic specialist. Peltier is kept busy setting up a dealer organization, selling to builders, and helping prospective homeowners decide to install a heat pump.

"The biggest problem in selling not only heat pumps, but any type of residential air conditioning," says Peltier, "is to get dealers who are set up to make a proper installation.

"This problem has to be solved first by the distributor and then by the dealer. The only way for the distributor to do it is to hook up with a dealer who is adequately trained and staffed to do the job right and who has the desire to do it."

Ad Directs Readers To Call Distributor

Peltier noted that Copeland's advertising directs inquiries to the distributor and not to individual dealers.

"We want them to call us," Peltier explained. "Every man in this organization from president to TV serviceman knows the story on heat pumps. And he can tell that story enthusiastically.

"We handle the initial contact and do much of the selling job because the dealer is generally not interested in doing the pioneering work on this," he commented.

"At this point the prospect is usually most interested in information about the heat pump. It is an unknown quantity to him. We can give him the complete story.

"The typical dealer is more than likely to start right out talking about how much it is going to cost the prospect and there's another sale right out the window.

"If the prospect is ready to build, I will go over his plans with him. By studying them, I can give him a close estimate on installed cost. That's what the customer really wants to know.

He's not interested in what the unit costs. He wants to know how much the complete job will be. By giving him an estimate, we give him something to think about.

"We advise him, however, that this is just an estimate. He must get a firm price from the installing dealer. We supply him with the name of his closest dealer.

60% of Heat Pump Sales Made to Builders

Peltier estimated that 40% of Copeland's heat pump sales were direct to the customer—through dealers. The other 60% were made to builders, which the distributor handles direct.

Last spring Copeland gathered builders together for an open house and gave them the Adaptomatic story. The company also persuaded the sponsors of the *Better Homes & Garden* model home that opened here last August to install a Fedders heat pump.

"This home drew many inquiries about the heat pump. It helped to convince builders that heat pumps will now sell houses," Peltier asserted.

Now You Can Save $1000 And More
HEATING AND COOLING ANY TYPE OF HOME WITH A
FEDDERS HEAT PUMP
Adaptomatic
CENTRAL AIR CONDITIONER
New Fedders Unit Effects Savings Up To 66⅔% On Electric Heating Bills For New Or Old Homes
Here is good news of great savings for builders of new homes and owners of existing homes who plan to heat electrically. This good news concerns the introduction here of the new, year 'round Fedders Heat Pump Air Conditioner. Builders who have seen it say it is the greatest contribution to home heating economy ever devised. Homeowners are excited over the great savings it makes possible.
The Fedders Heat Pump can be installed, ready for use, for about $1000.00 less than the cost of heat pumps of other makes. Installed, a Fedders Heat Pump costs only a little more than the average cost of a conventional heating plant . . . giving you for the extra few dollars, a central cooling system to cool every room in your home.
The Fedders Heat Pump is a combined heating and cooling appliance which operates by extracting heat from the air. It cools without water in summer, heats without fuel in winter, and reverses automatically from cooling to heating as your room temperature dictates. It maintains at all times the exact temperature demanded by the setting of its thermostatic control. For example: spring or fall days may call for "cooling"—at night the room & outside temperature may demand a little heat. The Fedder's Heat Pump takes care of both situations automatically, without any attention whatsoever.
The operating principles of the Heat Pump are based on two simple scientific facts. One: there is always considerable heat in the air, even at below zero temperatures. Two: a cold object attracts heat from a warmer one. The Heat Pump simply brings the outside air into contact with something colder—in this case a refrigerant, thereby extracting heat from it. The heat is then pumped into the house.
This heat in the outside air can be called "nature's free fuel." Making use of it through a Fedders Heat Pump, you can heat your home electrically for about one third the cost of heating with resistance type electric heaters. For example: if it costs $150.00 a year to heat a house with ordinary electric heaters, you can heat it for about a third of that amount with a Fedders Heat Pump.
Won't you let us tell you more about Fedders?
FREE SURVEY
and cost estimate arranged by your Fedders Dealer without obligation.
For Complete Descriptive Literature CLIP AND MAIL COUPON TODAY!
No Obligation
COPELAND & COMPANY
900 E. Fifth Ave., Knoxville
Phone 3-7135
COPELAND & CO.
Please send me FREE literature on Fedders new HEAT PUMP air conditioning.
Name C.H. Cobb
Address 384 A. Kerwee
City or Town Knoxville

INSTANTANEOUS response was received from this advertisement emphasizing the economy of the heat pump, according to Copeland & Co., Fedders distributor in Knoxville, Tenn.

MINERALLAC PERFORATED STRAP
Versatile Hanger Iron

Safely supports hanging pipes, conduits and cables up to 500 lbs. ¾ in. 20 gauge electro-galvanized steel. ¼ in. holes on ½ in. centers. Various lengths available. *Send for literature.*

MINERALLAC ELECTRIC COMPANY
25 N. PEORIA ST. • CHICAGO 7, ILL.

October Conditioner Sales Up In 4 Cities

DETROIT—In four cities at least, air conditioner sales for October surged strongly ahead of the same month in 1957.

October sales by wholesalers to dealers in the Union Electric Co. territory in St. Louis were 264% over the same month last year. Wholesalers moved 571 units to dealers as compared with 351 in September and 157 last October.

For the first 10 months, these distributors sold 18,726 units, a gain of 16% over the 16,176 sold last year.

The Electric Association of Philadelphia reports that distributors there netted 718 units in October, after deducting returns of units sold on consignment in previous months. Last year, the net figure was 111 units. For the first 10 months, these distributors sold 42,374 units as compared with 45,269 in 1957.

Washington, D. C. dealers sold 220 room air conditioners in October, up from 154 in the 10th month of last year, according to the Electric Institute of Washington.

Their 10-month sales totaled 20,734 units as against 22,633 last year.

Electric Power Board of Chattanooga reports dealer sales of 19 domestic air conditioners, 15 of them central units, and 16 domestic heat pumps during October. Thirteen commercial air conditioning units were also sold. Of the 17 electric furnaces sold, 16 were installed in air conditioning systems.

This record compared with 14 domestic air conditioners and six domestic heat pumps, seven electric furnaces, and eight commercial air conditioners in October, 1957.

In southeastern Kansas, on the other hand, dealers sold only 27 central air conditioning systems in October as compared with 48 in the same month last year, according to the Kansas Gas & Electric Co. Their room air conditioner sales for the month were up to 28 units from 12 last year.

For the 10 months, room air conditioner sales numbered 6,379 units, down 11% from 1957 and central air conditioner sales totaled 530 units, down 27% from last year.

Keith's Air Conditioning Gets $ Million Order

HOUSTON, Texas — Scholz Homes, Inc. has made arrangements to purchase about one million dollars worth of Carrier residential air conditioning systems from Keith's Air Conditioning Co. to install in the new homes it builds.

F. H. Marsters, Houston district sales manager for Scholz, made this announcement in explaining that all Scholz homes in the retail price brackets from $12,500 to $18,500 will be centrally air conditioned.

New England Home Show Set for March 18-24

BOSTON — The 1959 New England Home Show will be a combined trade and consumer show staged at the Commonwealth Armory here March 18-24, it was announced.

BETTER NOT CALL IT A BIBLE

But the famous Harry Alter *Dependabook* is really the standard buying guide of the trade. It's the most complete refrigeration and air conditioning supply catalog in the whole industry. It is especially designed for your convenience. (Even has your net cost on every item to save time in pricing a job.) For the newest products and latest prices always use the *Dependabook.*

We're Real Specialists in
REFRIGERATION • AIR CONDITIONING • ELECTRIC MOTORS
SUPPLIES and PARTS

SAVE MONEY, time and effort by ordering from our new *Dependabook,* the most complete catalog of all. 160 pages. Over 10,000 items carried in stock. *Wholesale only.* Your orders filled really fast by mail, or picked up at one of six big warehouses.

Write on your letterhead for the 1959 DEPENDABOOK . . .
Also our monthly Flyer of surplus and close-out Bargains.

The HARRY ALTER CO., Inc. Chicago 16, Ill. 1777 S. Wabash Ave. New York 13, N. Y. 134 Lafayette St. Dallas 7, Tex. 122 Parkhouse St. Atlanta 10, Ga. 690 Stewart Ave., S.W.
FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES

WHAT . . WHEN . . WHERE

National Association of Home Builders Exposition
Jan. 18-22, Chicago.

Industrial Heating Equipment Association Meeting
Jan. 19-20, Cleveland.

International Heating & Air Conditioning Exposition and Annual Meeting
Jan. 26-29, Convention Hall, Philadelphia.

Home Improvement Products Show
Feb. 4-6, Coliseum, New York City.

Franchising Heat Pump Dealers--

(Concluded from Page 1)

ages about $30; the cost differential between two heat pumps, a ton apart, may be as much as $500.

In southern areas, the cooling load is most important; in the north, the primary function of the heat pump is heating, Yeary continued, and in both areas load calculations require more care and attention than do conventional heating-cooling systems.

Even where calculations have been carefully accomplished, he stressed, it is a reasonable assumption that—in areas where power costs are high—heating power costs will exceed the cost of a season's demand of gas or oil.

Importance of Infiltration

Yeary stressed the importance of infiltration in load calculations.

"At 70° winter differentials, approximately 76 B.t.u. are required to heat 1 cu. ft. of infiltrated air; in colder climates as much as 92 B.t.u. per cubic foot are required.

"Suppose there are 250 c.f.m. of infiltration unaccounted for in the load estimate. At a 70° differential, this requires 19,000 B.t.u.!" he exclaimed.

While air leakage around windows and doors is all too often glossed over without serious results in standard load calculations, he insisted that this factor must be considered for heat pump applications.

Recognizing that some would object that adequate ventilation is needed in a structure, Yeary countered that it is almost impossible to exclude completely infiltration air from the average residence regardless of construction. "Some air enters every time an exterior door is opened; few homes are so perfectly constructed that the walls do not admit air on the windward sides.

Forced Ventilation Will Tax Heat Pump

"If sufficient reason exists for the introduction of forced ventilation, remember that each cubic foot of ventilation air must be heated or cooled and imposes a rather severe load on the heat pump indoor section during the heating cycle."

Heat pumps are moving into a favorable first cost position, and one manufacturer is bringing 3 and 5-ton heat pumps within $100 of the cost of the comparable cooling unit, stated E. R. Ambrose, head, Air Conditioning Div., American Electric Power Service Corp., at the ASRE heat pump conference.

Annual production increases for the past several years have paralleled the production of cooling units, Ambrose offered, and "indeed, the heat pump may trigger a greater demand for both types of units."

Admitting that operating costs vary from area to area, he showed that fossil fuels have steadily increased in price while electrical power has reduced relatively. Further, he estimated that while fossil fuels will increase some 35% in years to come, electricity will increase only 5%.

Generally reviewing available types of heat pumps, F. J. Reed, chief engineer, ARI, defined three classifications:

1. Room or window units up to 2 hp., delivering 10,000 Bt.u. at 0° with strip heaters. These are "non-engineered applications."

2. Unitary or package units, either self-contained or split. These are semi-engineered or engineered.

3. Field assembled, fully engineered applications.

Air-to-air heat pumps dominate the residential and small commercial applications, according to Reed. These units deliver 3.5 to 4.3 B.t.u. per watthour at 0° on heating cycle. "Direct resistance heating delivers 3.4.

"On cooling, these units deliver 6 to 7 B.t.u. per watthour."

Floor discussion brought out the fact that after the balance point of a residence has been reached, the compressor runs continuously; it does not cycle as it does above the balance point and as a furnace does at any temperature. Subsequently, cost of operation rises rapidly when operating below the balance point.

No decisions were reached during discussions of such points as optimum air temperature rises and leaving air temperatures.

E. J. Wellman, associate professor, Purdue university, presented areas where improvements are needed if heat pumps are to experience a more than gradual growth.

1. Initial costs of heat pumps are high.

2. Operating costs are above those for other systems (except resistance heating) in most areas.

3. The heat pump has the unfavorable load characteristic of decreasing capacity as temperature differential increases.

4. The low load factor of the heat pump prevents utilization of electric power at the lowest rates.

5. Noise from compressors and fans may be objectionable.

Cory-Mitchell Suit--

(Concluded from Page 1)

tax deficiency of more than $1 million.

Cory further alleges that Bernard A. Mitchell, then president of Mitchell, concealed the existence of a tax examination of Mitchell that, it says, began in July, 1955.

Mitchell, Cory says, also warranted that air conditioning units it made were exempt from Federal excise tax when company officials knew that they were not exempt.

By its suit, Cory seeks an accounting of all transactions and sums affecting the true value of the assets of Mitchell to determine the amount by which the defendants are liable for alleged misrepresentation and concealment.

Defendants are Bernard A. Mitchell, Florence and Donald M. Green, Leonard H. and Nettie Solomon, Mitchell and Harry Iglow as trustees for Lee Harley Mitchell and the Victorial Carla Mitchell trust, and Harry L. Solomon (former Mitchell treasurer) and Arthur A. Green as trustees of the Nettie Solomon trust.

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H&M Cooling Towers are available in capacities of 2 thru 125 tons. Types include propeller fan, centrifugal fan and take-apart models. See your local wholesaler, or write for more information. Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.

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COOLING TOWERS • WATER-COOLED CONDENSERS
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They'll Do It Every Time

by Jimmy Hatlo

DOOBILL MOANED AND GROANED TO ONE AND ALL ABOUT THE FIVE DOLLARS HE LENT TO LASAGNA....
LOOK AT THAT FOUR-FLUSHING @&%#! OWES ME FIVE BUCKS SINCE LAST TUESDAY! I'LL GIVE HIM ONE MORE DAY, THEN I'LL TAKE IT OUTA HIS HIDE!!
THANX AND A TIP OF THE HATLO HAT TO AL TORKELSON, 15 LANTON AVE., STATEN ISLAND, NEW YORK
TODAY HE GOT HIS FIVE BUCKS BACK--NOW LISTEN TO THE BIG FINANCIER....
THANKS, DOOBY--YOU WERE A FRIEND IN NEED--HERE YOU ARE--
WHAT'S THIS FOR? ARE YOU SURE YOU GOT IT FROM ME? I DON'T REMEMBER! I DON'T NEED IT NOW--NO HURRY ABOUT IT....
10-31

It's the Grandest Time of The Year

CHRISTMAS is wonderful. It's a time when love, affection, friendship, and goodwill—those human attributes which make life most worth living—abound everywhere.

It's a time when the cares of business are doffed, and people count their blessings. Hence, no business-problem editorial this week. Rather a few thoughts, from Great Minds, which may be appropriate.

Oh, yes! Merry Christmas, everybody!

And calling to Him a child, He put him in the midst of them, and said, "Truly, I say to you, unless you turn and become like children, you will never enter the kingdom of heaven. Whoever humbles himself like these children, he is greatest in the kingdom of heaven."—MATTHEW 18:2-4.

The wildest hope of a healthy person is to get back to his first Christmas party and be shy enough to be happy.—GILBERT K. CHESTERTON.

There is a strange reluctance on the part of most people to admit that they enjoy life.—WILLIAM LYON PHELPS.

I sometimes think that the supreme art of life consists in knowing what to let go, what to give, what to leave behind as we travel through this world.—REV. JOHN HAYNES HOLMES.

Love is an ocean of emotion, entirely surrounded by expenses.—LORD THOMAS ROBERT DEWAR.

It is love that reveals to us the eternal in us and in our neighbors.—MIGUEL DE UNAMUNO.

Religion is at least an obligation, rationally right, to play the game fairly, squarely, and worthily with our fellow men.—C. WARDELL STILES.

There's nothing worth the wear of winning
But laughter, and the love of friends.—
HILAIRE BELLOC.

Christianity is not being destroyed by the confusions and concussions of the time; it is being discovered.—HUGH ELMER BROWN.

Love and health remain the keynote of human happiness, and they are free.—KATHLEEN NORRIS.

One should recognize that humor is a form of philosophy.—ANDRE MAUROIS.

Piety is more often saved from most of its obnoxious characteristics by a sense of humor than in any other way.—REV. HENRY H. CRANE.

What we all want is what the old people call the grace of God—I call it a sense of humor.—J. A. R. CAIRNS.

Surely the astounding and beautiful fact about human existence is that transfiguring times may come to the commonest or simplest person, that suddenly some undistinguished, negligible man or woman who never said or did anything notable before may be caught up in unaccountable glory and made a beacon for mankind.—ST. JOHN ERVINE.

Music should be looked upon not as a form of pleasure but as an emotional shampoo.—PERCY C. BUCK.

It is hard to realize that people can be different from ourselves and yet not be inferior.—DEAN VIRGINIA C. GILDERSLEEVE.

And she shall bring forth a son, and thou shalt call his name JESUS: for He shall save His people from their sins.—MATTHEW 1:21.

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THIS JOKE TURNS OUT TO BE A REAL 'CHOKER'

74 Wall St.
Binghamton, N. Y.

Editor:

As a long-time subscriber to the NEWS, I have been a consistent reader of your column "Inside Dope" and have enjoyed your comments and jokes. I also own a copy of "One Foot in the Door" which I treasure.

A short time ago I stopped in for a highball at the end of a day of work and a guy told the following story I thought you might enjoy:

A man went to a doctor complaining that he felt funny. The doc said "What seems to be the trouble?" "Well, Doc," said the guy, "My eyes pop and my ears ring." After examining him, the doctor said "You will have to have your tonsils out." The man agreed and the tonsils came out.

A little while later, the same condition came back, so the man went to another doctor giving the same complaint and this doc after examining him said, "Your teeth are causing the trouble and must come out." So our friend said "O.K." and out came his teeth.

Soon, however, the same symptoms returned so he went to still another doc who, after examining him, said, "Man, you have only six months to live!!"

Well, since our friend had only six months to live and had some money saved, he decided to have some fun, so he bought a Cadillac, hired a negro chauffeur, had some suits tailored and went to a shirt-maker to be measured for some tailor-made shirts.

The shirt-maker measured him, calling out measurements to his assistant and when he came to the collar size, called "Size 17." "No," said the man, "I wear a size 16 collar." "No mister," said the shirt-maker, "If you wear a 16 collar, your eyes will pop and your ears will ring."

The fellow who told me that, was a chunky-built guy with protruding eyes which he could protrude more at will and I nearly fell off the bar stool on one drink. Did you ever laugh so hard your sides ached? . . . Mine did.

Keep up the good work with "Dope" especially. I look forward to it every week and relay the best jokes to my son who is in Georgia Tech. He likes them too.

W. H. BRAYMAN

FRENCH FIRM WANTS TO MARKET HUMIDIFIERS

Societe Franco Americaine
Paris (2e), France

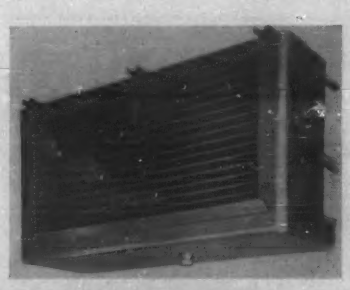
Editor:

We would be interested in the purchase of air humidifiers, autonomous and automatic that can be assembled in the plenums of the 'year-round self contained air conditioner units," or into its shafts of air distribution, and for a capacity between 3 to 15 tons.

We should appreciate it if you would give us the firms in the U.S.A. who manufacture this kind of equipment, or better yet, to intervene directly with them, in order that they will mail us their catalogues and prices for distributors.

We thank you in advance for your kindness.

S.F.A.E.M
HARRY FLORIAN



Drayer-Hanson Offers Hot Gas Defrost Units

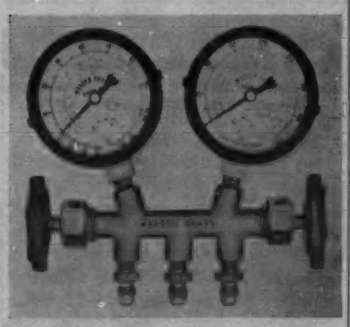
• Newest addition to its refrigeration products is "Flocold" hot gas defrost unit line, announces Drayer-Hanson, Div. of National-U. S. Radiator Corp., Dept. AH&RN, 3301 Medford St., Los Angeles 63.

Drayer said the new line of unit coolers is adaptable to any type hot gas defrost system, over or under 34° F. An option of either electrical or hot gas heated drain pan is offered with the unit. The cabinet sets on hanger mounts for overhead installation.

Flocold hot gas units are initially being offered in 10 models. Fan range is 750 through 11,000 c.f.m. Total coil surfaces, per unit, range from 105 up to 1,540 sq. ft.

Over-all dimension of smallest model is 16⅝ in. high by 20 in. wide by 26¾ in. long. Largest unit is 37⅝ in. high by 20 in. wide by 104¾ in. long.

Coil drain header has been designed so coil can be fed by refrigerant distributor on cooling cycle. Condensed refrigerant can by-pass distributor, on condensing cycle.



Madden Develops Double Gauge Charger, Tester

• A newly-designed double gauge charging and testing unit has been announced by Madden Brass Products Co., Dept. AH&RN, Aurora, Ill.

This unit features an all-brass forged body, easy-grip handles, and "Teflon" seat for positive shut-off without stress and strain, the company said. Seat is replaceable, thereby prolonging life of unit, it was noted.

"Designed for charging, and for testing and purging both high and low sides, this unit helps servicemen find trouble quickly," accord-to the firm. "Three ¼ in. SAE flare connections enable unit to be used with Madden color coded charging lines, thereby eliminating line tracing by servicemen.

"Also available is the exclusive Madden handy hose holder. This may be attached to back of unit so hoses or charging lines can be hooked on when not in use, keeping them clean and dry. This is optional. Also available is an optional hanging hook."

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'Low-Headroom' Air Distribution Unit Bows

• A "low-headroom" air distributing unit with an over-all height of less than 28 in. is available from Westinghouse Sturtevant Div., Dept. AH&RN (T-378), 200 Readville St., Hyde Park, Boston 36.

The unit, made in six sizes with up to 16 sq. ft. of cooling coil face area, is especially designed for installation in buildings where space requirements, in particular unit height, must be kept at a minimum, the company pointed out.

These units (Series LH-1600) are available in ratings to handle 1,130 to 9,600 c.f.m. And, since each is equipped with chilled water cooling coils and steam or hot water heating coils, they are rated at 4.3 to 36.0 tons cooling capacity and 108 to 920 MB.t.u.h. heating capacity, it was explained.

Low-speed forwardly curved fans and flat filters are used in the entire series.

Norge Expands Use of Automatic Ice Cube Service In '59 Line

• Automatic ice cube service has been expanded in the 1959 line of Norge refrigerators, it was announced by Norge Div., Borg-Warner Corp., Dept. AH&RN, Merchandise Mart Plaza, Chicago 54.

An automatic unit is "plumbed into" one 15-cu. ft. model. Automatic ice cubes are optional in another 15 and two 13-ft. refrigerators.

Other features include "Swing 'N Serve" swing-out shelves and "finger-touch" shelf adjuster. Frozen food capacity is emphasized.

Color styling of arctic mist turquoise "harmonizes with any kitchen setting." A recessed design provides a functional wall-with-wall fit.

Top of the line is the two-door, refrigerator-freezer model CBA-1558, with a built-in icemaker. The freezer locker of the 15-ft. refrigerator holds 152 lbs. of frozen foods. In addition to Swing 'N Serve trays, this model has a removable Swing 'N Serve crisper.

MODEL CBA-1558 Two-Door Norge Refrigerator-Freezer.

With the exception of automatic ice cube making, refrigerator-freezer model CCB-815 is identical to the CBA-1558. Suggested cash selling prices are $649.95 for the CBA-1558 and $569.95 for CCB-815, according to Norge.

Next model is the CTS-913, a two-door, 13-cu. ft. refrigerator-freezer with 116-lb. capacity for frozen food, Swing 'N Serve shelves and crisper, and optional ice cube service (Automatic Handi-Cube). Model CS-913 is the single-door counterpart of the CTS-913, providing the same features. Suggested prices are $479.95 (CTS-913) and $429.95 (CS-913).

Eleven-cubic-ft. capacity models are the C-911, a customatic refrigerator-freezer priced at $349.95, and the D-911, a deluxe refrigerator with a suggested price of $249.95. Both hold approximately 60 lbs. of frozen foods.

More details on the products described on this page may be obtained by writing the manufacturer at the address given in each story.

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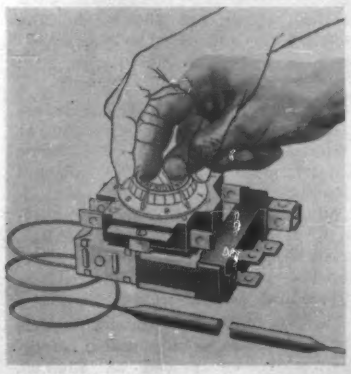
Controls Offer Shallow Depth Mounting



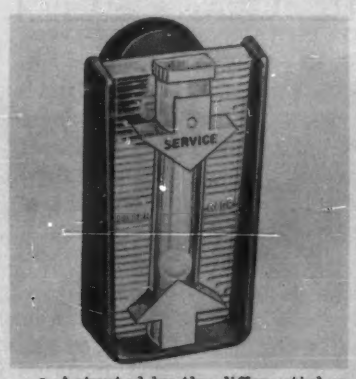
• Two new series of cycling thermostat controls designed to offer shallow depth mounting and side access to terminals have been introduced by Ranco Inc., Dept. AH&RN, Columbus 1, Ohio.

The controls, designated C21 and C22, are designed to operate window or unit air conditioners, compressors, strip heaters, and reverse-cycle heat pumps under cross ambient conditions and in a wide range of applications.

The C21 series is available as thermostat alone or with the new "dial-within-a-dial" manual rotary circuit selector switch to provide up to four circuits for compressor cooling or strip heating and step operation of compressors or heaters.

The C22 control is available as thermostat only or with the same rotary circuit selector switch. The control automatically operates heat pumps with reversing valves with or without de-icer controls, two-stage units with stand-by capacity, and dehumidification systems with reheat. It can control two, three, or four different devices.

Plastic Gauge Tells When To Change Filter

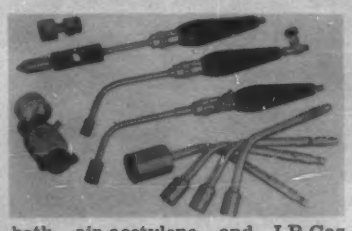


• Actuated by the differential or drop between atmospheric and blower compartment pressures, its new filter gauge indicates both the gradual clogging of the unit's filter as well as the exact time when change or service should be made, according to F. W. Dwyer Mfg. Co., Dept. AH&RN, P. O. Box 373, Michigan City, Ind.

Costing $1.95, the plastic gauge needs only one drilled hole for installation (without access to back of panel), the company said. Similarly, a single knurled knob suffices for all adjustment necessary, it was stated.

Three different capacities fit all types and sizes of furnaces, air conditioning systems, room coolers, etc., and special types are also available for the OEM market, the announcement said.

Linde Adds Complete Line of L-P Gas Appliances

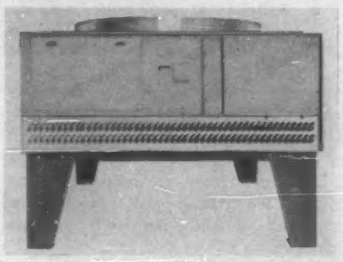


•Addition of a complete line of LP-Gas appliances to the wide selection of "Prest-O-Lite" soldering, heating, and brazing equipment already available through suppliers of its products has been announced by Linde Co., Div. of Union Carbide Corp., Dept. AH&RN, 30 East 42nd St., New York City 17.

The new equipment includes open-flame torch stems in six sizes and an enclosed-flame soldering iron stem, all of which fit interchangeably on three styles of torch handles designed to operate in both air-acetylene and LP-Gas service.

An adjustable pressure regulator, melting furnace, and double-duty (air-acetylene or LP-Gas) hose assemblies complete the line.

McQuay Adds Vertical Flow Air-Cooled Condensers



• A new line of vertical flow air-cooled condensers, designated as "A B" Aircons, has been announced by McQuay, Inc., Dept. AH&RN, 1600 Broadway St., N. E., Minneapolis 13.

Designed primarily for low silhouette appearance, the new Aircons "fully utilize the effect of natural convection, reducing operating costs by lowering fan power consumption," according to the announcement.

They are available in eight sizes from 7½ to 50 tons nominal capacity in a single unit, require no wind deflectors, and with multiple installation, capacities are unlimited, the company further pointed out. They are belt driven, remote and are designed for waterless refrigeration and air conditioning.

Framing Angle Assembles Without Welding, Drilling

• Development of a new, versatile framing angle, fabricated from cold-rolled galvanized steel, has been announced by Acme Steel Co., Dept. AH&RN, 135th St. & Perry Ave., Chicago 27.

The new material, "AIM Brand Slotted Angle," has a precision-engineered recurring pattern of slots and holes to provide speed and convenience in assembly and structural strength and rigidity, according to the company. It is designed to provide a wide variety of structures which can be assembled without welding or drilling and without the need of special skills or tools.

AIM Brand Slotted Angle is packaged in 10 and 12-ft. lengths, 10 lengths to the package with 75 nuts and bolts included. The material is manufactured in two sizes: Standard 225-80 which measures 2¼ in. by 1⅛ in. by .080 in. and heavy-duty 300-104 which measures 3 in. by 1⅛ in. by .104 in.

Ebco Restyles Oasis Dehumidifier Line

• Complete re-styling of its "Oasis" dehumidifiers was announced by The Ebco Mfg. Co., Dept. AH&RN, 265 North Hamilton Rd., Columbus 13, Ohio.

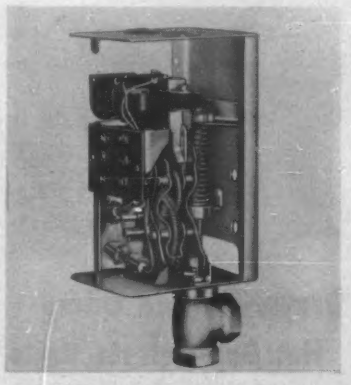
Complete with built-in humidistat, Super Deluxe model SD-32 is said to remove up to 4 gal. of water every day from basements or other closed areas totaling up to 14,000 cu. ft. The Mocha Tweed vinyl-clad cabinet is accented by a gold anodized aluminum grille. This dehumidifier, one of two available models, weighs 55 lbs.

Deluxe model D-28 can remove up to 3½ gal. of water each day from an area up to 12,000 cu. ft., according to Ebco. The unit is finished in green stipple-tone baked enamel. The grille is of a silver finished pattern weave design.

A 2-gal. capacity, unbreakable polyethylene moisture container is mounted in the back of both models.

Both stand 23½ in. high, 12 in. wide, and 14½ in. deep (with receptor). An automatic humidity control is available as an accessory on the Deluxe unit, which weighs 52 lbs.

More details on the products described on this page may be obtained by writing the manufacturer at the address given in each story.



Motorized Control Valves Have Mercury Switches

• Silent mercury switches are now a standard feature of all Edwards motorized zone control valves, it was announced by Edwards Engineering, Inc., Dept. AH&RN, 101 Alexander Ave., Pompton Plains, N. J.

The switches are completely enclosed, hermetically sealed, and silent with an indefinite shelf and operating life, it was stated.

The motorized valves are used to control Edwards "Zone-A-Matic" heating systems in homes, hotels, offices, hospitals, and similar multi-zone buildings. No thermal leakage is possible with these valves during closing because of positive shut-off, the company claims.

A powerful electric motor gear drive powers the valve. It uses a standard three-wire thermostat, with 24-volt operation. Electric power is drawn only for short intervals during the actual opening or closing of the valve.

"BUY FROM FABRIKANT"

Lowest prices for imported copper, brass, aluminum sheets, coils, manufactured strictly to ASTM and Federal specs. Large stocks all gauges and sizes on hand New York warehouse.

Orders also solicited for forward shipments.

Stocklist and prices upon request.

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"SERVING THE METAL INDUSTRY FOR OVER A QUARTER OF A CENTURY"

MARSH
Instruments

THE SERVICEMAN LINE of Testing Gauges, Testing Thermometers, Timers, etc.
PRESSURE GAUGES and Dial Thermometers for all services.
MARSH-ELECTRIMATIC, Water Regulating Valves, Solenoid Valves.
MARSH INSTRUMENT COMPANY
Sales Affiliate of Jas. P. Marsh Corporation
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Seal of Quality?

THE MOTOR USED IN THIS EQUIPMENT IS PROTECTED AGAINST OVERLOADS, LOW VOLTAGE, OVER-VOLTAGE WITH A MIGHTY MITE THERMAL PROTECTOR

MECHANICAL INDUSTRIES PRODUCTION CO.
223 ASH STREET • AKRON, OHIO

ARE you in need of a "just right" man to fill a slot in your organization—the man you are looking for will be reading the

NEWS' CLASSIFIED ADS

Report on Education

Another article in a series dealing with all levels of education and training in the air conditioning and refrigeration industry.

By Frank J. Versagi, Technical Editor

9. What and How Schools Teach

We mentioned earlier that a major contribution of industry to education is the wealth of information available in the scores of company brochures, bulletins, and texts. Quite a few schools use manufacturers' literature as supplementary material, and a few use some literature for primary instruction. Trane's "Air Conditioning Manual" is an example of a company-originated text which has found high acceptance even at the college level, and it is now sold as a standard text.

Next in general acceptance as texts comes the association books as ASRE's "Data Book" and ASHAE's "Heating, Ventilating, Air Conditioning Guide," and manuals published by National Warm Air Heating & Air Conditioning Association.

At the trade level, easily the most popular book is Althouse & Turnquist's "Modern Refrigeration and Air Conditioning," a book which lends itself well to teaching or to review of fundamentals.

Two newer texts at the engineering level are W. F. Stoecker's "Refrigeration and Air Conditioning" (McGraw-Hill) and "Design of Air Conditioning Systems" by F. W. Hutchinson (Industrial Press).

Then there is an assortment of books on heating, cooling, or refrigeration which are used as supplementary or primary texts at schools of all levels. Actually, a heavy majority of instructors are not satisfied with textbooks available in the field, and a great many of them write their own text for a specific course.

Great need is for a text a little above Althouse & Turnquist, but a little below the engineering level books.

One very popular presentation of basic refrigeration is found in General Motors' (Frigidaire) "A to Zero of Refrigeration," a snappy presentation of fundamentals. The booklet is being used by a few schools in the adult education area — where one semester courses, all academic, are offered for interested people.

Use of texts and reading material naturally varies with instructors and type of course. Generally, most effective use of books is made when students are told to read material which is to be covered in the next lecture period. Thus, at least superficially familiar with the material, students have an easier time absorbing lecture.

A very few instructors actually read from texts and have students follow the reading.

At college level, it is not unusual for instructors to give reading assignments which coincide with lecture material, but to leave the choice of reading or not up to the student, since they should be adult enough not to need supervision in this respect.

Two teachers at the trade school level were found using this "adult" approach on semi-literate classes—totally ignoring the tremendous respect which such people tend to have for the written word, even though they find it a struggle to read understandingly.

Testing Students

How do you measure electricity?

How would you answer that question? "With a meter." "In amps, volts, and ohms." "By cutting into the line and. . . ."

At every level of education, there comes the time when the student is tested—both to prove what he has learned and to test the teaching effectiveness of instructors and courses.

But on the subject of tests there is controversy. Should tests be designed so they are easy to grade by instructors or their assistants? Are tests primarily to show what has been learned or are they part of the learning process? Which are the most valuable tests?

Practically, the controversy resolves itself into just how the question should be asked and answered. There are four basic methods in use:

True or False: A statement of fact or of alleged fact is made; the student merely circles the word True or False.

Example: "Water is the liquid used in all cases of liquid absorption systems. True—False."

Multiple Choice: An introductory clause or statement is followed by a list of several choices from which the student is to pick the correct conclusion.

Example: "The most desirable condenser for a domestic refrigerator is the—a) forced air type, b) gravity type, c) bare pipe type."

Completion: An introductory clause or statement is followed by a blank. The student is to conclude the statement with the correct words or sentences.

Example: "Food spoilage is caused basically by microscopic organisms called ———."

Essay: A direct question is asked. The student must answer in words or sentences as needed.

Example: "What are the advantages of mercury type contacts?"

Obviously, True or False and Multiple Choice tests are easy to grade, since all the grader need do is compare answers with a master sheet. Completion tests are only a little more difficult to grade. Essay answers require most time.

However, while ease of grading is a practical and desirable thing in itself, the chief function of a test is to benefit the student, not the teacher.

On this basis, there are those who consider multiple choice and true or false tests "bingo cards," which in no way test the student's progress.

"A person almost completely unfamiliar with a given subject can pass true or false and multiple choice tests," claims one trade school instructor who says his wife was able to pass multiple choice test on refrigerant properties "just from what she had picked up from me and by using common sense."

Completion questions are considered a bit more difficult in that the last word or phrase has to come from the student's head; it isn't already on the paper for him to choose or guess at.

"If we think of a test as being part of the learning process as well as a true measure of a student's progress, then nothing can beat the essay type question," is the opinion of many. Here the student is asked a question and must come up with a complete answer in his own mind, then present the answer intelligently.

The ultimate in this type of question, of course, is the college quiz which says merely, "Describe in detail the application of the principle of equilibrium in ——," and the student needs an hour to do the answer justice.

All of these testing methods are in use, and for the most part students seem unconcerned over which method is used although several instructors asked that the NEWS cover this point.

Tests given at Lennox show thought for this phase of education. Although their questions are multiple choice, the answer usually calls for several and sometimes all of the choices given, thus requiring more than a quick guess at the most likely answer.

Example: "High head pressure can be caused by a) plugged liquid line strainer, b) overcharge of refrigerant, c) dirty condenser, d) condenser blower not running." (B, c, and d all should be checked by the student.

At the beginning of this discussion of tests, we posed the question, "How do you measure electricity?"

While students, as a rule, are not concerned with which test method is used, they are very irritated by ambiguous or misleading questions. So many times, instructors know exactly what they have in mind when they write a question, but the written query is unclear to others.

To avoid this, some teachers submit their test questions to another instructor or anyone else before using them in class.

Job Placement

A problem with which manufacturers' and association schools need not concern themselves is that of job placement.

All other types of schools, however, have to give it some thought, even if they ignore it finally.

Right off, it can be said that no reputable school promises employment upon the completion of its training program.

The advertising of some schools has been criticized, however, because it gives the impression—on first reading—that "jobs are waiting." The criticism is based on the fact that the semi-literates so often attracted by this advertising definitely have the impression that there will be a job for them when they finish training.

At the college level, and in some technical institutes and even in some trade schools, company representatives interview students either at the school or at the local company office.

There are schools which send a list of resumes of their graduating students to employment offices around the country.

Others determine openings by diverse means then send students to apply for the positions.

A few schools have the man do his own prospecting, then send a resume and letter of recommendation to any leads he digs up.

Finally, there are those schools which merely issue form letters or certificates saying the student has finished such and such a course. In these cases, the student is completely on his own.

Cooperative training is available at a few schools—usually at technical institute level and above. Hudson Valley Technical Institute, as an example, has a co-op plan which takes effect after student has completed six months of training. He is placed on a job related to his curriculum and will have accumulated six months actual field work before graduation from the two-year program.

The student is wise to keep his eyes open for employment opportunities all the while he is in school, and he must give consideration to the union situation with references to apprentices in the locality of his choice.

If a student is thinking of going into business for himself, he should consider that it will take a minimum of several hundred dollars just to get basic tools. And he will need business know-how as well as service know-how.

(Next: Industry's Role In Education.)

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greater capacity with
SEMI-CIRCULAR
UNIT COOLERS

NOW... EXCLUSIVE CIRCUITING SYSTEM

prevents coil "frost-up"

Freeze-up, common to similar units, is completely eliminated. Newly designed air diffusers insure proper air distribution to utilize entire coil surface for more efficiency and economy of operation.

New electrostatic filters and full size heat exchangers are featured on Krack Semi-Circular Unit Coolers—plus other design and construction advantages. Capacities: 360 to 1075 BTU/hr. at 1° T.D.

Send coupon today—for new bulletin giving all specifications.

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Manufacturers of freon, ammonia, flooded ammonia heat transfer equipment

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What's Going On in Commercial Refrigeration

News of Markets, Products, Methods

NCRSA Roundtables Offer Ideas for Cutting Costs, Selecting Salesmen, Charging for Plans, Adding Lines

MIAMI BEACH, Fla.—A new and instantly popular feature of the National Commercial Refrigerator Sales Association convention here was the round table conference.

Divided into groups of 10, the distributors and manufacturers attending put their heads together and discussed the best means of cutting costs and handling problems facing the distributors.

At the end of an hour's discussion, group chairmen reported to the entire assemblage on the results of the discussions at their tables.

Here are some of the comments that developed:

Losses in copper tubing and fittings on installations might be reduced by (a) having jobbers bid on the entire order and taking the best bid, or (b) having the job foreman keep track of all fittings and tubing used on the job.

"Free" service for the first year or 90 days is not really free. It is charged for in the job estimate. One distributor builds goodwill by notifying his customer just before the free service period expires.

Installation problems can be reduced by having the salesman make up a checklist of problems to be met on the particular job. It is important for him to check the installation on completion to see that the customer is satisfied.

It is a good idea to keep records to compare estimated costs of installation with actual costs. Biggest problem is estimating the time required to do the job.

These estimates are always low. Additional costs not included in the estimate are also serious problems.

A question that got no answer was how far the installation crew should go in removing old cases and their contents.

In selecting salesmen, it is suggested that the new man be a family man, have a church connection, have a good credit rating, have a good background, and be looking for a career, not a job.

References should be checked.

On distributor suggested that ex-managers of food stores make excellent equipment salesmen.

Distributors avowed that there is a need for a good general school on salesmanship for dealer salesmen. This should not be conducted by factories or dealers but by an educational institution.

Some suggested that prospective salesmen first spend time with the servicemen making service calls. Another would put him out with the top salesman.

One distributor commented that salesmen should make personal reports on their progress. Written reports are never read, he contended.

At one table, distributors charged 3% of estimated cost of the job for drawing up and furnishing plans. They would like to do the same with supermarkets but can't get away with it.

Whether or not plans should be left before the order was placed brought a little difference of opinion. Some said drawings might be given before the order, but plans should not be given the market operator before the sale was assured.

Distributors agreed that they should handle all lines that fit into the supermarket but not if they are going to require frequent service. Active records of new lines should be kept so profitable lines can be retained and unprofitable ones dropped.

One danger of diversified lines was that the distributor might find himself drifting out of the food store field.

(A more detailed discussion of the problem of diversified lines will be carried in a later issue of the NEWS.)

Western National Restaurant Show Set for Aug. 31

CHICAGO—Preparations are under way for the Western National Restaurant Show to be held in San Francisco Aug. 31 to Sept. 4, 1959, according to the National Restaurant Association.

NRA stressed that the western show does not replace the annual National Restaurant Convention and Exposition which will be held in Chicago next May 11-15, but supplements it.

The western show will be staged by NRA in conjunction with the Golden Gate Restaurant Association (San Francisco), the Associated Restaurants of Oregon, and the Southern California Restaurant Association (Los Angeles).

Meetings will be aimed at problems peculiar to the food service industry in the 11 western states, while the exhibits will be those of food equipment manufacturers and suppliers from all over the country, it was pointed out.

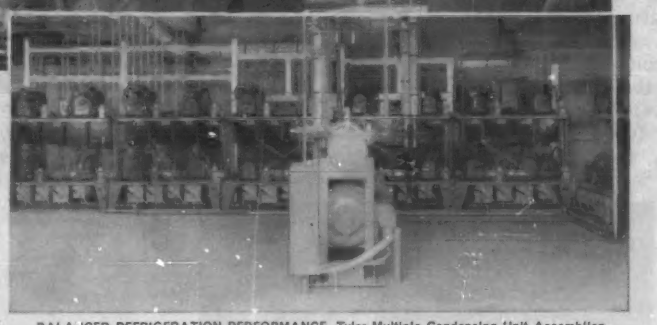
In Eugene, Oregon

Tyler-planned and equipped for

"MAXIMUM OPERATING EFFICIENCY!"

Outstanding merchandisers Harold Davidson (left) and C. W. Tidwell, two of four partners of the City Drive In Market.

"... most modern, easy-to-shop supermarket in the Northwest ... designed for maximum operating efficiency," say owners of Oregon's famed City Drive In Market. Tyler-pioneered no-glass, open-front Sales-Cases make it easier for shoppers to see, to reach, to *buy more!* Tyler drastically reduces upkeep expenses with lower condensing unit requirements that save up to 1/3 on electric current alone. *Balanced* refrigeration performance! Dozens of other Tyler extras that save steps, cut costs, boost sales. Get all the facts. Make comparisons! Check construction, performance, *all the way through.* Call your Tyler Distributor today!



BALANCED REFRIGERATION PERFORMANCE. Tyler Multiple Condensing Unit Assemblies cut costs, save floor space, insure better performance. Completely engineered at Tyler factory.

Copyright 1958, Tyler Refrigeration Corporation

TYLER-EQUIPPED ALL THE WAY with complete installation of Frozen Food; Ice Cream; Meat; Produce; Dairy Sales-Cases—Walk-In Coolers, Freezers.

FASTER, EASIER REAR LOADING with modern Tyler Meat Sales-Cases. Tyler Rolling-Cold Packaging Conveyors (rear) cut costs, boost pre-packaging efficiency, safeguard meat quality!

TYLER

PIONEER of important improvements

TYLER REFRIGERATION CORP., Niles, Mich.
Canada: Tyler Refrigerators, 732 Spadina Ave., Toronto, Ont.
(Export Tyler Refrigeration International, C. A., Apartado Postal 9262, Caracas, Venezuela, South America)

TYLER gives you more!

MOVE AHEAD WITH TYLER

Tyler Refrigeration Corporation, Dept. AR12, Niles, Michigan.
Send data on new Tyler ☐ Sales-Cases ☐ Air-Stream Sales and Storage Cooler ☐ Condensing Unit Assemblies ☐ Shelving ☐ Checkouts ☐ Color System ☐ Store Planning ☐ Reach-Ins ☐ Storage Freezers ☐ Walk-In Coolers ☐ Shopping Carts ☐ Rolling-Cold.

NAME _____

ADDRESS _____

Lightweight, Flush-Fitting Plastic Door Claimed To Reduce Refrigerator Loss

NEW LIGHTWEIGHT, flush-fitting plastic cold storage door, called Jamolite, is said to reduce refrigeration losses, minimize worker fatigue, and cut cleanup time.

* * *

HAGERSTOWN, Md.—A new lightweight, flush-fitting plastic cold storage door and frame has been developed by Jamison Cold Storage Door Co. here.

Claimed to reduce refrigeration loss and cleanup time, the new door is called "Jamolite." It is much easier to open and close than the wood or metal clad doors and will minimize fatigue of employes—women in particular—working in-and-out of cold storage areas, the manufacturer said.

It also costs less than previous freezer doors of comparable insulating efficiency. Hermetically sealed construction gives longer door life under high humidity conditions.

The compact door requires less aisle space for the full door swing, and permits the use of less bulky, more attractive hardware. The weight and design of the door make it easy for one man to install on light bucks comparable to those for household doors, the manufacturer says. It is available in white and other colors.

Insulation is foamed-in-place polyurethane plastic with a thermal insulation K-factor of 0.21 at 75° F. This insulating quality enables a 4-in. thickness of the urethane foam to provide all the insulation necessary for cooler and most freezer installations, Jamison claims.

The average size flush plastic doors weigh 70 to 80 lbs., approximately one-quarter that of equally effective metal-clad freezer doors. Exterior of glass-cloth reinforced polyester plastic can be wiped clean with soap and water or commercial cleaners. Water spots and streaks are not as apparent on the surface. Polyester plastic has one of the hardest plastic surfaces—Rockwell M-scale of 80 to 103—so the doors resist scratching and staining. The smooth, uninterrupted surfaces present no place for dirt to lodge. Frames are of the same material and can be cleaned just as easily.

A range of colors and sizes is available in both reach-in and walk-in cooler and freezer doors. Vertical-sliding package-passing doors and horizontal-sliding walk-in doors are also available in standard sizes.

Freezer applications are equipped with Jamison Frostop in the head, side, and sills. For severe freezer conditions, doors with 6-in. thick insulation can be supplied.

Hart Takes Newly Created Position At Hussmann

ST. LOUIS—John R. Caulk, Jr., executive vice president, Hussmann Refrigerator Co., announced the appointment of L. E. Hart to the newly-created position of director of manufacturing engineering.

Hart comes to Hussmann from the Nashville plant of Avco Mfg. Corp. where he was manager - manufacturing engineering. He brings with him a total of 26 years of experience.

Your Customers' Best Buy. . .
(and yours, too!)
IDEAL
Speed-Freeze
PRODUCTS
BEVERAGE COOLERS
unexcelled storage capacity with Ice Cube Makers
OUTSTANDING SECTIONAL METAL WALK-IN COOLERS
IDEAL
COOLER CORPORATION
2830 MAGAZINE ST.
ST. LOUIS 6, MO.

AMBASSADOR WITH TOOLBOX

THE MAN WHO INSTALLS AND SERVICES HUSSMANN EQUIPMENT

His briefcase is a toolbox . . . his top hat has a bill. But he's a full-fledged ambassador . . . a man who builds good will.

This man in the field is a mighty important link between Hussmann and the food store merchant.

His skillful installation work builds confidence in Hussmann and Hussmann distributors.

The service he renders in the years that follow . . . creates good will and keeps the customer happy with Hussmann.

His pleasant way of dealing with Mr. Merchant makes friends for Hussmann, too.

Hussmann salutes the refrigeration service man . . . the ambassador of good will who helps turn prospects into customers and brings customers back to buy again.

HUSSMANN

HUSSMANN REFRIGERATION, INC., HUSSMANN BUILDING, ST. LOUIS 6, MISSOURI
HUSSMANN REFRIGERATOR CO., LIMITED, BRANTFORD, ONTARIO, CANADA 6-58

STORAGE AND DISPLAY REFRIGERATORS • CHECKOUTS • SHELVING • REFRIGERATION FOR FOOD STORES LARGE OR SMALL

Investigate 'Copper Poisoning' In Carbonators

SACRAMENTO, Calif.—"Two outbreaks of copper poisoning attributed to carbonated beverage drinks purchased from coin-operated dispensing machines" have been investigated by the California State Dept. of Public Health, it was reported in the November issue of *National Restaurant Assn. News.*

Samples of carbonated beverages taken following the two outbreaks showed copper concentrations of 260 p.p.m. and 66 p.p.m. "Toxic limits of copper are not known," the article stated, "however, it is believed that they are less than 10 p.p.m. when taken in doses of 8 to 12 ounces."

(*Editor's Note:* Standard practice calls for carbonated fluids to be handled in stainless steel or block tin equipment and lines. The carbonators, as such, use no copper in contact with the carbonated liquid. In these cases of copper poisoning, it is the accidental carbonation of water in the *supply line upstream of the carbonator* which has caused the difficulty.

Such supply lines are fitted with check valves whose function it is to prevent carbon dioxide from backing up into the supply water. On the running cycle this contaminated water is pumped into the carbonator.)

In discussing this poisoning report, A. I. Heim, research engineer of Copper and Brass Research Assn., pointed out that the incidents occurred "some time ago," and that they have been widely circulated, which might give the feeling that there have been widespread cases of copper poisoning, which is definitely not the case.

"There can be no denying that if a faulty valve admitted carbon dioxide into water standing in a copper tube, the copper pickup would be very high and if ingested would cause nausea and vomiting," Heim said.

"This is poisoning in the technical sense," he continued, "but it is not poisoning as understood by the layman. It should be understood that 'toxic' does not mean 'lethal.' This toxic effect of copper in large quantities is to cause nausea and a rejection of the material by vomiting.

"Copper passes through the system and is eliminated in normal body processes; it is definitely not a cumulative poison," Heim further emphasized.

He reported that, while the U. S. Public Health Service has established a limit of 3 p.p.m. in drinking water, it is generally accepted that amounts up to this amount are not only not harmful, but are actually beneficial to health.

(*Editor's Note:* Some European countries make common use of copper in cooking utensils.)

Concerning the carbonators, themselves, William Pollock, service manager, Temprite Products Corp., Birmingham, Mich., pointed out that recommendations of the U. S. Dept. of Health call for two check valves in series in the water supply line to carbonators.

According to Pollock, a code is in preparation which will also call for spring loaded ball type check valves. "When a check valve is not spring loaded," he explained, "it is quite possible, momentarily, for pressures to equalize on either side of the valve and allow some mixing of the separated fluids."

Often the check valves are mounted on the header of the carbonator. Where they are mounted several feet away, the supply line from the check valve to the carbonator must be stainless steel or block tin, he stated. Nylon or other inert materials have also been used.

R. C. TROW

R. J. LICKTEIG

Queen Products Helped King-Seeley Up Sales

ANN ARBOR, Mich.—By including nine months' sales of Queen Products, Inc., which was purchased on Oct. 31, 1957 and dissolved on July 31, 1958, King-Seeley Corp. here was able to report a 4.8% increase in sales over the previous fiscal year ending July 31.

"Our line of ice-making machines showed a good increase in volume over Queen's volume for the previous year."

On total sales of $36,554,801, King-Seeley reported a net income of $888,713, 6.5% lower than for the previous year.

The annual report also noted the election of Robert C. Trow as vice president of King-Seeley and general manager of Queen Products Div. and of Robert J. Lickteig as vice president of King-Seeley in charge of ice maker sales, Queen Products.

McCray Licenses Smithfield In London

KENDALLVILLE, Ind. — J. W. Krall, president of McCray Refrigerator Co., Inc. here, and W. Horace Partridge, managing director of Smithfield Refrigerator Co., Ltd., London, England, have signed an agreement licensing the latter firm to manufacture products of McCray design and granting it selling privileges in the British Isles.

Smithfield Refrigerator was founded 50 years ago by Partridge's father, to manufacture ice boxes for butchers. When mechanical refrigeration was introduced in England the company adapted it to its own equipment and today is the largest company in the country manufacturing insulated fixtures, according to the announcement.

Upon his return to London, Partridge will send over top production and engineering personnel to study McCray manufacturing procedures and methods as well as design.

Preliminary contacts with Partridge were established by H. A. Sillcox, president of Sillcox Refrigeration Corp., New York City, export representative for McCray.

This is the third licensing agreement that McCray has negotiated in the past 18 months. The other two were with the Eisfink Co. in Asperg, Germany and D.G.M. Refrigeration, Ltd., in Sydney, Australia.

CHARLES LOFINO, Owner
Lofino's IGA Foodtown, Dayton, Ohio

"This is why I buy McCray"

"My reason is simple," explains Charles Lofino, "it's the finest! And, believe me, I've checked them all for appearance, merchandising, operation and service.

"It's only natural that, when I started my third store, I again called in my McCray distributor who's so well qualified to design and completely equip my super market. The pictures give just a hint of the beauty of this McCray installation and my sales figures speak well for its merchandising power."

Mr. Lofino's fine experience with McCray refrigerators, through the years, is another demonstration of the value of a McCray franchise. The performance, dependability and styled-ahead beauty of McCray merchandising cases holds the old customers and brings in new ones.

McCray Refrigerator Co., Inc., 1201 McCray Court, Kendallville, Ind.

68 Years of Leadership in Building Dependable Commercial Refrigerators

McCray
KOLDFLO

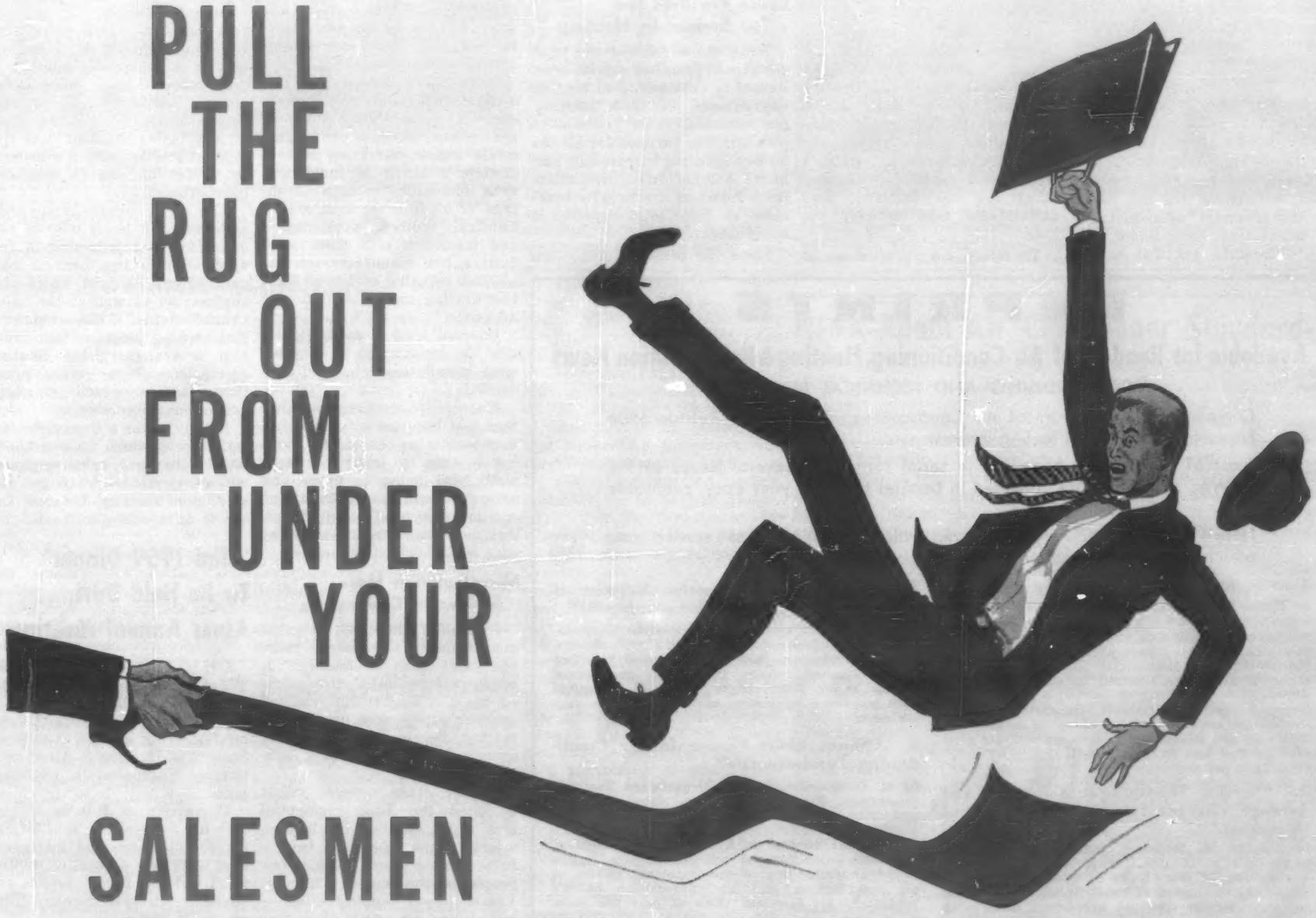
A COLDIN FRANCHISE IS YOUR DOORWAY TO BIGGER PROFITS

Coldin Commercial Showcases are profit-packed for dealers in every section of the country. The unlimited types and sizes of units, superb quality and advance design are sales-clinching inducements for every prospect. Get ahead as a Coldin dealer. Inquire today!

Every Size for Every Need for Every Food Retailer

COLDIN
CABINET CO., Inc.
2800 webster avenue, new york 58, n. y. • cypress 5-3311

HOW TO PULL THE RUG OUT FROM UNDER YOUR SALESMEN



The day of *salesmanship* is here—and no one knows it better than your competitor! That's why your salesmen need every bit of backing they can get.

That's why failing to advertise *regularly* can amount to pulling the rug right out from under your salesmen, leaving them without the competitive advantage of having their sales story seen *repeatedly* by the men they must sell.

Every call your salesmen make is more important than ever. You can help make each call more effective by pre-selling prospective customers through industry-wide advertising in AIR CONDITIONING, HEATING & REFRIGERATION NEWS, the Weekly Newspaper of the Industry.

Use NEWS advertising regularly and consistently for maximum help to your salesmen.

AIR CONDITIONING
HEATING & REFRIGERATION
The Newspaper of the Industry
RESIDENTIAL — COMMERCIAL — INDUSTRIAL

NEWS

The leading air conditioning publication with highest paid circulation in the field.

450 WEST FORT STREET
DETROIT 26, MICHIGAN

- NEW YORK, 521 FIFTH AVE., MURRAY HILL 2-1928-9, ROBERT M. PRICE.
- CHICAGO, 134 S. LA SALLE ST., FRANKLIN 2-8080, REX SMITH.
- LOS ANGELES, 4710 CRENSHAW BLVD., AXMINSTER 2-3601, JUSTIN HANNON.
- DETROIT, 450 W. FORT ST., WOODWARD 2-0924, AL SCHILDHAMMER.

TECHNICAL CENTER

By Frank J. Versagi, Technical Editor

Heat Load Calculations . . .

. . . And the Sales Engineer

Once upon a time six different sales engineers were given plans of a single structure and told to calculate the cooling load. They came up with six distinctly different results.

Another time, 10 manufacturers came up with recommendations varying from 2 to 5 tons for the same residence.

There are those who assume such differences are the result of disagreement over methods of calculation; some admit that the differences are due not so much to disagreement as to ignorance and confusion.

Theoretically, there are "standard" methods for determining heat loss and/or gain. ASHAE has chapters on heating load and cooling load; ASRE has one on air conditioning calculations. Almost universally, except in classrooms, standards are ignored to the degree that "they are too involved; load calculations take entirely too long."

Therefore, a profusion of **short forms**, which allow quick heat load calculations with "practical accuracy." Then, too, many, many load calculations are made strictly by guess-and-by God. In effect, a man judges the load by his experience with similar structures and never performs a single actual calculation on the structure in question.

Loose Practices Not Too Serious In Heating

Many have pointed out that such loose practices can be overlooked or covered up in heating applications. In tract housing, for example, it is possible to pick one size furnace for all the houses ignoring orientation, sun load, internal load, insulation. Such furnaces are usually oversized so their total capacity is never used.

Since the price difference between a furnace designed to deliver 60,000 B.t.u. and one designed for 80,000 can be less than $50, poor or never-performed heat loss calculations are never a problem.

Such laxity cannot be tolerated in designing electric heat systems—either resistance or heat pump. Because of the generally higher operating cost of electric heat, it is important, even mandatory to take advantage of all internal heat load—lighting, motors, appliances—and insulation is a must, with quite a few manufacturers and utilities refusing to install electric heating unless insulation is adequate.

Internal load is more significant in commercial and industrial installations than in residential.

Not only operating cost, but first cost becomes a factor when heat pumps are considered. Playing it safe by using the next sized heat pump to cover any errors in heat loss calculations can mean several hundred dollars, not less than $50 as is the case with combustion heaters.

Miscalculation More Serious In Cooling

In cooling, the effect of gross miscalculation is generally more noticeable than in heating. A previous Technical Center pointed out the major condensation problem experienced by a supermarket because of a grossly oversized air conditioning system.

At the other extreme might be cited the 3-ton residential unit which handled the load in a large ranch type house beautifully—**unless there were a few people in the house.** The unit just could not handle the load—hot air and all—when there was a social gathering in the living room or when holiday cooking was being done in both basement and kitchen, and a few guests were about.

Short Forms Vary

Undoubtedly, some miscalculations are due to the differences in the several short forms. Picking three such forms at random, we find on the subject of "people" factors of 220, 300, and 400 B.t.u. for people at rest or in slow movement. One form allows 660 B.t.u. for people at work; two do not mention working people at all.

On a specific item like steam tables, one form allows 550 B.t.u. per square foot of surface area for electric tables, 1,300 for gas tables. Second shows 500 B.t.u. per lineal foot of steam table. This same form shows 2,000 B.t.u. for an ambiguous "gas burner."

Proponents of short forms insist that the absolute differences in total B.t.u. in examples such as these are small—on the order of a few hundred. They ignore completely the fact that the percentage errors approach 200% in some instances; this can have a profound effect on final equipment selection.

At first glance, an obvious corrective factor would be to standardize all the short forms, and do away with the personal preferences of manufacturers and some trade groups. While helpful, there is some doubt about the total effectiveness of this approach, and one authority has gone so far as to state that it is useless to standardize load calculations, "unless you first standardize people."

A position which recognizes the importance of psychological factors in evaluating comfort.

Perhaps a more meaningful approach would be to educate better, or restrict the activities of, the "sales engineer" (of the type who is actually a salesman by profession and an engineer by courtesy).

The true engineer-turned-salesman will know how to use discretion and judgment in the application of any form on load calculation; he will know the engineering as well as the sales characteristics of his equipment. Experienced judgment will guide him in evaluating the relative significance of the several practical factors which go into proper machine selection.

Finally, after a thorough load estimate in which he has confidence, the real sales engineer will never undersize to get the sale, nor oversize because the job is on a cost-plus basis.

A more recent address has been provided the NEWS for "The Refrigeration Journal," published in Australia. The present address is 62 Margaret St., Sydney, N.S.W., Australia.

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3. "Operating Costs of Residential Air Conditioning"

by R. A. Gonzales, Director of Technical Service, Airtemp Division, Chrysler Corporation. Four pages, 8½ x 11 size. Case histories of three groups of houses, complete with types of residential air conditioning installed,—controlled tests of additional kilowatt hours consumed in the operation of air conditioning complete with interpretation, significant conclusions and selling points when your prospect asks "How much will it cost me to operate," only 25¢ each.

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6. "Short, Short Course in Air Conditioning Fundamentals"

by D. C. Schaffer, Service Department Training Supervisor, Frigidaire Division. Basic, easy-to-understand explanation of "air conditioning" including air, moisture, air distribution, trouble shooting air, ventilation, filtration, sound comfort. A basic course for the serviceman providing a broad understanding of the important phases of air conditioning and an appreciation of it's problems. An excellent book at only 25¢ each.

7. "Electrical Characteristics of Packaged Air Conditioning Units"

by P. W. Wyckoff, Chief Engineer, Airtemp Division. An excellent discussion of electrical problems faced by air conditioning manufacturers, servicemen, and electrical utilities based upon the increasing electrical demands of air conditioned homes. Only 25¢ each.

8. "Corrosion"

by Frank J. Versagi, NEWS Technical Editor—the causes and effects of corrosion in air conditioning and refrigeration systems. Complete in 7 Parts including Chemical Corrosion, Electrochemical Corrosion, Role of Water in Corrosion, and Plastic Pipes. Written in down-to-earth terms. Provides you with another useful tool in your service work—only 50¢ each.

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12-22-58

'Illini 1959 Dinner' To Be Held During ASHAE Annual Meeting

CHICAGO — An informal "Illini 1959 Dinner" and "get together" will be held on Tuesday, January 27, during the annual meeting of the American Society of Heating & Air-Conditioning Engineers in Philadelphia.

University of Illinois alumni who are in heating, ventilating, air conditioning, and refrigeration work are especially invited to attend the dinner. Ladies are welcome, whether they are Illini or not, it was noted.

Tickets and reservations may be obtained from S. I. Rottmayer, 407 S. Dearborn St., Chicago 5, Ill. The dinner will be held at the Bellevue-Stratford hotel in Philadelphia. A social hour preceding the dinner is planned for 5:30 p.m.

Kalish To Dispose Of Surplus Products For York Corp.

YORK, Pa.—George I. Kalish, New York district sales manager for York Corp., subsidiary of Borg-Warner Corp., has been assigned to the disposal of surplus finished products for the company.

According to A. R. Rising, vice president and director of marketing, Kalish will sell to jobbers, exporters, and others not covered by regularly established sales outlets. His activities will be largely concerned with such York products as hermetic compressors, condensing units, residential air conditioners, and space chillers. No current models will be involved, Rising said.

Kalish will continue to make his headquarters at 100 E. 42nd St., York's New York office.

HIGHLIGHT of Chrysler Airtemp's recent National Business Conference was this display of the firm's 1959 line of room air conditioners. Three lovely hostesses point out sales features of the new models for the 400 distributors, dealers, and field representatives attending the conference. The meeting outlined the division's plans for 1959 and displayed new products for the first time to the men who will be selling them.

Airtemp Business Conference--

(Concluded from Page 1, Col. 5)

& Myers reportedly sold 22,000 room air conditioners.

At the conference, Stahl & Myers placed an order for 15,000 units with delivery to start in mid-January.

Ogden said Airtemp's advertising programs during 1959 will be aimed at strengthening and reinforcing the "image of Chrysler Airtemp as the leader."

"We plan to stress our experience, quality, engineering, and service in establishing a position of leadership in this industry," he declared.

He said advertising schedules will be more concentrated than in past years.

"Through trade magazines we hope to attract new distributors and dealers, while through consumer publications, both in the building fields and in general circulation, we hope to increase consumer awareness of Chrysler Airtemp name and products."

C. J. Katte, director of personnel of the air conditioning and heating equipment division, said Airtemp will add 450 hourly-rated employes to its production force by mid-January. About half the job openings will be filled by workers currently laid off, he added.

CRMA Members See Business Pickup--

(Concluded from Page 1, Col. 4)

opinion on the future of the industry's sales, there was complete unanimity in the panel's prediction of substantially improved general business through most if not all of next year.

The commercial refrigerator manufacturing executives seemed of the opinion that the observable feeling of relief over the country's fast come-back from the recession, plus the confidence being generated by reports of business improvement in a great many lines, will be reflected in the construction and modernization of food store and food service facilities on a materially higher level than in 1958.

Individual estimates of the extent of increased demand for industry products ranged from 5% to 10%.

A discussion of cost trends and employment problems was sparked by a panel made up of John E. Ahrens, The C. Schmidt Co.; G. J. Doyle, C. V. Hill & Co.; and Karl Weber, Weber Showcase & Fixture Co. There was general agreement that the most serious problem confronting businessmen today is the virtual certainty that the now too familiar pattern of wage-price leapfrogging will continue indefinitely.

It was pointed out that commercial refrigerator manufacturers have been pricing their equipment at about the same levels that applied at the end of the Korean war, rising costs having been offset to some extent by substantially greater volume and more efficient production methods. However, one executive stated, "we've just about run out of gas."

Other discussion leaders included A. B. Biddle, Hussmann Refrigeration, Inc., who reported on the recent convention of the National Commercial Refrigerator Sales Association in Miami (some details of which are reported in this and previous issues of the NEWS) and Edward N. Northey, Herrick Refrigerator Co., who told of the progress being made by the food service equipment segment of the association in developing new sanitation standards for reach-in refrigerators and walk-in coolers.

For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.

NCRSA--

(Concluded from Page 1, Col. 3)

collections are improved over the early part of the year.

But, nevertheless, they require careful watching. Several members indicated they had refused a number of orders with low credit ratings as repossessions in some areas had been almost ruinous to distributors accepting orders of this type.

Profit picture was reported by several to be very good.

One member indicated that customers are becoming increasingly interested in the technical aspects of the equipment they purchase. Salesmen should be able to answer technical questions intelligently, he suggested.

G-E Cooling--

(Concluded from Page 1, Col. 2)

"This is just a logical combination of similar businesses making products to accomplish the same end result—air conditioning," Reiger explained. "The new, combined department will concentrate on heating and cooling devices for the home, but its market also will include those commercial and industrial installations that can be made with similar equipment."

Moeller said that the department will have two functional organizations, the marketing, engineering, manufacturing, and finance sections for room heating and cooling units continuing in Louisville, and the similar sections for central equipment continuing in Tyler, Texas, and Trenton, N. J.

"Thinline" room air conditioners for zone-by-zone cooling and "All-Weather" room air conditioners for heating and cooling will continue to be made at Appliance Park where work also continues on development of the proposed "Thermaline," a zonal heat-pump device, central air cooling equipment, and the "Weathertron," a heat pump for central heating and cooling, will continue to be manufactured at Tyler. The department also will continue to make gas and oil-fired warm air furnaces at Trenton.

General Electric announced that it would stop making and selling large equipment for the central air conditioning of commercial and industrial buildings that it had been making at its plant at Bloomfield, N. J., and that the Bloomfield plant would close on April 1, 1959. It was also announced at the same time that production of water coolers, the only other product made at the Bloomfield plant, would be transferred to Louisville.

Moeller said that existing distribution systems for the products of the combined departments would be continued. Room air conditioners are distributed along with other General Electric major appliances through districts of the division's Sales & Distribution Dept., managed by P. A. Tilley, and through independent distributors.

The company's central air conditioning products also are distributed through independent distributors and some company-owned branches, set up solely for this business. Some of these branches may be merged with Sales and Distribution Districts, Moeller said.

W. J. Aulsebrook To Retire Jan. 1

EVANSVILLE, Ind. — W. J. Aulsebrook, veteran of 35 years in the refrigeration and air conditioning business, has announced his intention to retire Jan. 1, according to John R. Morrill, general manager of the Evansville Div. of Bendix-Westinghouse.

Aulsebrook, who began his career teaching school, started refrigeration work as a service engineer in Denver in 1923. He worked 30 years for Servel, Inc.

For the last two years, he has been manager of quality control for Bendix-Westinghouse.

TOM BYRD (center), president, Lau Blower, newly-elected president of the National Warm Air Heating & Air Conditioning Association, is congratulated by the retiring head Frank L. Meyer, Meyer Furnace, while new board members Charles H. Franke, American Furnace, and Harold W. Mutz, Peerless Corp. (at left) and Harry C. Gurney (right), Janitrol, new second vice president of the association, beam approval.

NEMA Room Air Conditioner Standard--

(Concluded from Page 1, Col. 5)

clude means for ventilating and heating."

Ogden commented that the material contained in the standard is "not intended to preclude the exercise of ingenuity in testing or to prevent improvement in product design and performance" by member companies in the section.

He pointed out that the standard is entirely voluntary and does not prevent any member or non-member of the association from manufacturing or selling products not conforming to the standard.

Members of the section are Admiral Corp.; Airtemp Div., Chrysler Corp.; Amana Refrigeration, Inc.; American Motors Corp., Kelvinator Div.; Coolerator Div., McGraw-Edison Co.; Fedders-Quigan Corp.; Frigidaire Div., General Motors Corp.; General Electric Co.; Hotpoint Co., a division of General Electric Co.; I. W. Air Conditioning Corp.; Philco Corp., Consumer Products Div.; Westinghouse Electric Corp.; and Whirlpool Corp.

Rating portion of the new standard require that voltages be 115, 208, or 230; frequency 60 cycles; and cooling capacity, both total and latent, be given in B.t.u.h. Air ratings shall be in standard air, which is defined as "air having a density of .075 lb. per cu. ft. and is equivalent to dry air at a temperature of 70° F. and a barometric pressure of 29.92 in. of mercury."

It says the nameplate shall include the following minimum information:

1. Electrical data in accordance with Underwriters Laboratories, Inc. "Standard for Room Air Conditioners," Publication 484, September, 1957.

2. Total cooling capacity and/or heating capacity ratings in B.t.u.h.

Testing standards require that any production room air conditioner chosen at random shall meet the testing standards. Tolerances on all test readings shall be in accordance with ASRE "Standard Methods of Rating and Testing Air Conditioners" Publication No. 16-56, unless otherwise specified.

Tests to be made in accordance with this publication are:

Cooling and heating capacity, with actual capacity not less than 92% of nameplate rating;

Recirculated air quantity rating, with controls set for maximum cooling and the ventilating and exhaust air dampers closed;

Ventilating and exhaust air quantity rating, with zero static pressure differential between indoor and outdoor sides and with the cooling means and the heating means inoperative;

Electrical rating, with electrical power input not to exceed 110% of nameplate rating.

Power factor test will be in accordance with UL "Standard for Room Air Conditioners" Publication 484, September, 1957. Minimum power factors shall be 75% for units of under nominal ½ hp. up to but not including ¾ hp., and 85% for ¾ hp. and larger.

Total locked rotor current of any room air conditioner motor or motors, designed to start simultaneously by the controls provided, is the sum of the locked rotor currents of the individual motors. Total locked rotor current shall not exceed 46 amperes for units rated at 115 volts or 57.5 amperes for units rated at 208 or 230 volts.

Locked rotor current measurements are to be made according to AIEE "Test Procedure for Single Phase Induction Motors," Publication No. 502.

The standard also provides for a freeze-up test, an enclosure sweat test, maximum operating conditions test, condensate disposal test, and safety test.

Illinois Utility Can Finance Heating, Cooling

CHICAGO—Northern Illinois Gas Co. was authorized recently by the Illinois Commerce Commission to establish a fund to make loans to customers who need financing for combination heating-cooling units.

The commission set a limit of 200 customers who can be financed by the company.

Spartan Moves

SKOKIE, Ill.—Spartan Engineering Co., manufacturers' representative, announced that it is now located at 4654 Oakton St. here. Former address was 119 S. Jefferson St., Chicago.

Servicing Automobile Air Conditioners

(Vol. 3)

BY C. DALE MERICLE

This is another in the new series of articles on automobile air conditioners which has been prepared to enable the experienced refrigeration serviceman to cash in on this rapidly growing market.

New makes not previously discussed are being described in detail. Most of the series, however, is being devoted to 1958 models of the many makes of units that have already been discussed in the earlier articles. Data on these 1958 models is limited to the changes made over preceding models.

Performance Chart for 1958 Oldsmobile

Ambient At Cowl Inlet Relative Humidity (%)	Temp. (°F.)	Evap. Pressure At Schrader Valve (p.s.i.g.)	Engine Speed (r.p.m.)	L. Nozzle Air Temp. (±1°F.)	*Head Pressure ±5 (p.s.i.g.)
10	70	34		42	90
10	80	34	350-380	42	125
10	90	34	410-450	43	155
10	100	34	470-520	44	235
10	110	34	620-680	47	285
20	70	34	350-385	43	97
20	80	34	410-450	43	138
20	90	34	480-530	44	180
20	100	34	550-605	47	250
20	110	34	850-935	51	300
30	70	34	400-440	43	105
30	80	34	460-500	44	155
30	90	34	560-615	45	205
30	100	34	670-740	50	265
30	110	34	1140-1250	55	300
40	70	34	450-495	43	115
40	80	34	550-605	45	170
40	90	34	700-770	47	225
40	100	34	1000-1100	52	275
40	110	34	1710-1900	57	328
50	70	34	460-505	43	130
50	80	34	650-715	46	187
50	90	34	850-935	49	245
50	100	34	1130-1240	53	285
50	110	34	2050-2250	59	330
60	70	34	500-550	44	145
60	80	34	720-790	47	196
60	90	34	950-1045	51	248
60	100	34	1500-1665	56	294
60	110	34	2000-2200	62	338
70	70	34	550-605	44	160
70	80	34	800-880	48	205
70	90	34	1040-1145	53	250
70	100	34	1900-2090	59	300
70	110	34	2350-2585	64	344
80	70	34	700-770	45	165
80	80	34	980-1080	49	214
80	90	34	1200-1320	55	265
80	100	34	2050-2250	61	308
80	110	34	-	67	350
90	70	34	900-1000	45	175
90	80	34	1100-1210	50	227
90	90	34	1350-1485	56	280
90	100	34	2050-2250	67	320
90	110	34	-	69	360

*The low pressure (suction) reading should be 1 to 2 p.s.i.g. lower than evaporator pressure.

OLDSMOBILE

Oldsmobile Div.
General Motors Corp.
Lansing 21, Mich.

Factory-installed air conditioning system offered as an optional accessory on 1958 Oldsmobiles is essentially the same as the 1957 model. No significant changes affecting service procedures are incorporated in the 1958 system.

The 1958 model includes a Frigidaire compressor driven through a magnetic clutch, hot gas by-pass valve to control temperature and prevent icing of the evaporator, and vacuum diaphragms for actuating dampers or valves to operate on 100% outside air or a mixture of 75% recirculated air and 25% outside air.

Sight glass on 1958 models is found in the liquid line near the condenser instead of at the evaporator as on 1957 units.

Refrigerant charge on 1958 systems is 4⅞ lbs. of Refrigerant-12, the same as 1957.

Air temperature readings in the left-hand air discharge nozzle in the "road test" tend to run slightly lower for 1958 than 1957 models. When the system is operating correctly and the "road test" is conducted the same as for 1957 models, the 1958 system should show the following:

Ambient Temp. (°F.)	Relative Humidity (%)	Discharge Air Temp. (°F.)
70	50	41
70	60	41
70	90	43
80	50	43
80	60	44
80	90	48
90	40	43
90	50	46
90	60	50
100	20	45
100	40	53
100	50	57

If the "road test" results differ substantially from the above, then it is necessary to conduct a "performance test." The "performance test" on 1958 models is conducted the same as on 1957 systems, but the results should be somewhat different, as shown in the accompanying table.

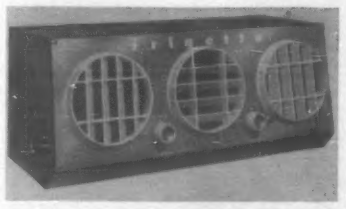


FIG. 1—Under-dash 1958 Frigette unit is designated as Model 580.

FRIGETTE

Frigiquip Corp.
3724 N. May Ave.
Oklahoma City, Okla.

Model 580 Frigette under-dash unit (Fig. 1) produced in 1958 by Frigiquip Corp. has essentially the same refrigeration system as employed on the 1957 model.

Compressor: The York A-210 compressor in either right or left-hand mounting is standard on the 1958 Frigette system.

A magnetic clutch is standard equipment.

Condenser: Condenser is located in front of the car radiator. Receiver tank and sight glass are located in the liquid line in the engine compartment.

Evaporator: Three adjustable round louvers are provided on face of 1958 Frigette unit. (Two louvers were used on the 1957 model.)

Controls: Two rotating control knobs are provided on the face of the evaporator in 1958 Frigette units.

Knob on right is connected to thermostat, permitting the clutch to be turned on or off and thermostat setting, which controls cycling of clutch, to be adjusted to obtain desired temperature.

Knob on left controls fan operation. A rheostat switch is used for fan control in the 1958 model, in contrast to the push-button controls used on the 1957 Frigette unit.

Refrigerant charge: Refrigerant-12 is employed in the 1958 Frigette. Charge is 2 to 2½ lbs.

Service hints: Essentially, the same service procedures covering the 1957 Frigette units will apply to the 1958 model.

VORNADO

The O. A. Sutton Corp., Inc.
1812 W. Second St.
Wichita 1, Kansas

Two major changes affecting service were incorporated in the 1958 Vornado line of automobile air conditioners produced by the O. A. Sutton Co.

First, the by-pass model was dropped, so that 1958 models consist only of units having a thermostatically controlled magnetic clutch as standard equipment.

Except as noted below, service procedures on the 1958 clutch model are the same as on the 1957 clutch model.

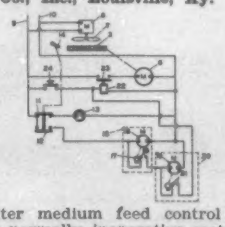
Second, the practice of using alcohol in the system was dropped for 1958 models. Instead, a refrigerant drier is incorporated in the receiver of 1958 units.

Refrigerant charge remains the same in 1958 models, however, consisting of 45 oz. of Refrigerant-12.

PATENTS

Week of Sept. 23 (Concluded)

2,853,155. FILTER APPARATUS CONTROL. William B. Peter, Louisville, Ky., assignor to American Air Filter Co., Inc., Louisville, Ky.

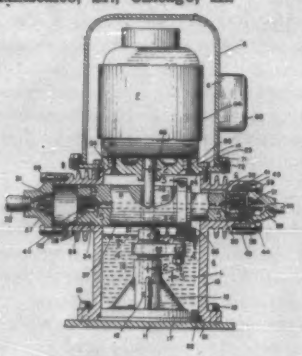


A filter medium feed control comprising normally inoperative motorized filter medium feeding means, first repeating cycle timing means operative in response to air flow through said filter medium, first switching means controlled by said first repeating cycle timing means and arranged to be selectively actuated thereby during a predetermined portion of each of said repeating time cycles thereof. . . .

2,853,156. CLEANING DEVICE FOR PRECIPITATOR. Peter Hodson, Wellsville, N. Y., assignor to The AFRA Precipitator Corp., New York.

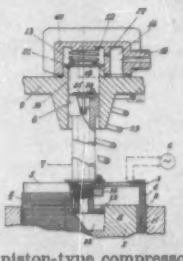
1. Gas cleaning apparatus including a dust collecting section having a housing divided into a series of adjacent compartments by parallel division plates; an outlet section superposed on the collecting section and divided into a series of converging compartments whose end faces terminate in an arcuate surface. . . .

2,853,226. COMPRESSOR. Pietro Maniscalco, Sr., Chicago, Ill.



1. A compressor comprising, a vertically-disposed supporting base forming a lubricating well, a motor-shaft bearing fixed on the base internally thereof, transversely-disposed axially-spaced and alined cylinders integrated with the base and connected at their respective outer ends with conduits forming a part of a refrigerant flow line. . . .

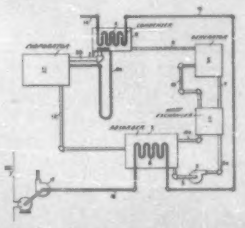
2,853,229. COMPRESSOR. Heinrich Dolz, Stuttgart-Mohringen, Germany, assignor to Sofix A. G., Vaduz, Liechtenstein, a corporation of Liechtenstein.



1. A piston-type compressor for small refrigerating machines comprising a cylinder open at one end, a piston reciprocable in said cylinder, a hollow piston rod extending from said piston and reciprocated by electro-magnetic means so that at the end of the stroke in the direction toward said open end of cylinder said piston at least reaches to said open end of the cylinder. . . .

2,853,275. AIR CONDITIONING SYSTEM. Richard A. Sturley, Kirkville, N. Y., assignor to Carrier Corp., Syracuse, N. Y.

1. An absorption refrigeration system comprising an absorber, a generator, a line connecting the absorber and the generator, a pump in the line for transmitting solution from the absorber to the generator, a condenser, cooling means in the condenser, a line

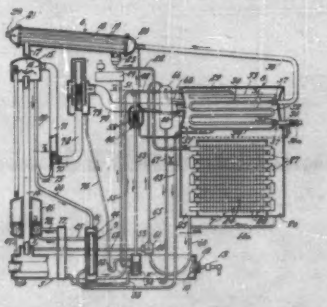


connecting the generator to the condenser, an evaporator, two lines connecting the evaporator and the condenser, a line connecting the evaporator and the absorber. . . .

Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

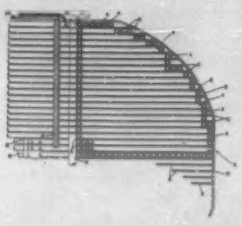
Printed copies of patents, reissued patents, and patent designs may be secured from the Patent Office; patents and reissues are 25¢ each, while designs are furnished at 10¢ each. Address orders to: Commissioner of Patents, Washington 25, D. C.

2,853,276. AIR CONDITIONING. Philip P. Anderson, Jr., Evansville, Ind., assignor, by mesne assignments, to Arkla Air Conditioning Corp.



1. In a heating and cooling system, an absorption refrigeration apparatus of the two pressure type charged with a refrigerant-absorbent solution and including a generator, a condenser, an evaporator which functions as a cooler on cooling cycles and as a heater on heating cycles, an absorber. . . .

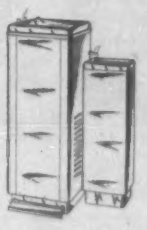
2,853,278. ANTI-VIBRATION CRATE FOR HEAT EXCHANGE TUBES. Harold P. Hesler, Fairway, Kan., assignor to The Griscom-Russell Co., Massillon, Ohio.



1. Anti-vibration support means for heat exchanger U-tubes disposed in spaced layers and having U-bent portions concentrically arranged in each layer, said support means comprising a crate including a shaft perpendicular to the layers of U-tubes and extending through the U-bends thereof, a strap surrounding the tube U-bends and attached at its ends to opposite ends of the shaft, spacer bars located between adjacent layers of U-tubes, and means connecting opposite ends of each spacer bar to the shaft and the strap.

DESIGN

183,562. WATER COOLING AND DISPENSING COMBINATION. William J. Hayes, Glen Riddle, Pa., assignor to Sunroc Corp., Glen Riddle, Pa.



Air Distribution Requirements In Year-Round Air Conditioning

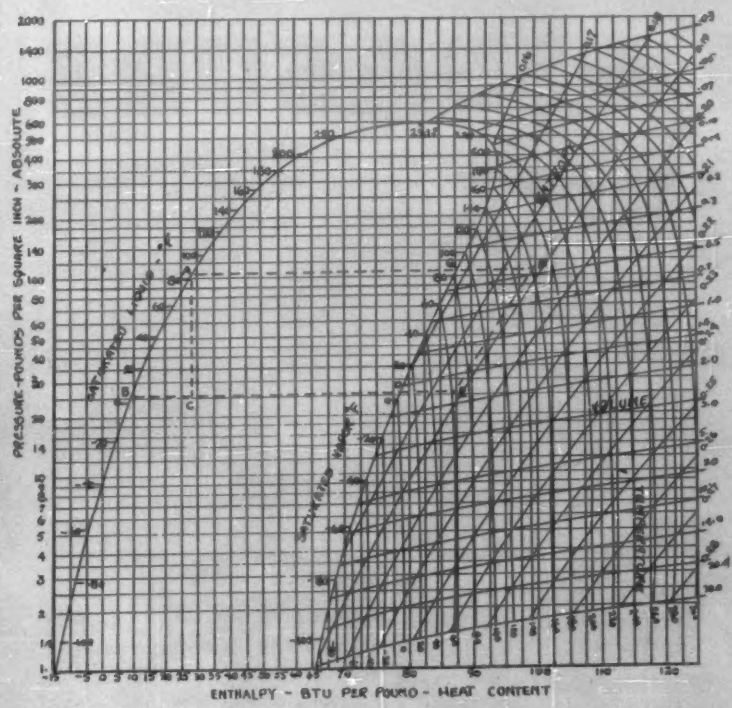


FIG. 49—Typical Mollier Diagram for Refrigerant-12.

Part 3—Fundamentals of Equipment

By Frank D. Klein, Chief Engineer, Governair Corp.

Having checked out the Evaporator capacity as outlined in the foregoing, let us assume then that the results indicate that the components in the refrigeration cycle are not performing according to design. Before investigating further the malfunction of the evaporator, the proper procedure is to evaluate the indicated malfunction from the standpoint of the entire system performance. Of course, the "heart" or the compressor is of prime consideration, and it is here that the Mollier Chart can be applied practically.

Mechanical difficulties or malfunction usually evidence themselves in a tangible form which can be ultimately corrected through observation and systematic checking. Usually in such a problem as is assumed here, nothing so simple points directly to the malfunction of the system.

Fig. 49 is a reproduction of the Mollier Chart for Refrigerant-12 and is a PRESSURE-ENTHALPY relationship. The pressures given are in absolute scale; however, to convert to practicality of gauge pressure merely subtract 14.7 or for even number 15. The values given at the bottom of the chart are indices of heat content of the refrigerant in B.t.u. per pound, more commonly known as enthalpy.

Note the curved line on the left labeled "Saturated Liquid," indicating the corresponding condensing temperatures and boiling point of the refrigerant to the pressures. Saturation, of course, means just that, completely liquid (or as much so as possible under the indicated pressure).

In explanation, assume the liquid in the liquid line of the system, just ahead of the expansion valve, should be 86° F. This would correspond to an absolute pressure of 110 p.s.i. The normal refrigerant tables for this refrigerant show that the Absolute pressure is actually 107.9 or 93.2 p.s.i.g., (pounds per square inch gauge).

CHECK POINTS LISTED

The check points of our investigation will involve:

1. Latent Heat of Vaporization.
2. Total Heat Content of the Liquid Refrigerant.
3. Superheat of the Suction Vapor.
4. Discharge Temperature of the Refrigerant Gas on Discharge.
5. ENTROPY (as opposed to ENTHALPY, which is the sum of the internal and external energies or the thermodynamic potential at the given pressure; ENTROPY being the index or measure of the unavailable energy).
6. Net Refrigerating Effect.

Refer then to Fig. 49.

Using the 86° point as above and following this line down to the 108 p.s.i. Absolute cross section, it is found that there are approximately 28 B.t.u. per pound of refrigerant representing the heat in the refrigerant at this temperature and pressure.

However, as the liquid is metered to the evaporator through the expansion valve, the pressure will drop to that of the evaporator itself. Assuming that the evaporator is at 5° F. the actual gauge pressure at this point is 11.81. There is thus a drop through the expansion valve to the evaporator of 27 p.s.i. Absolute from 108 p.s.i. Absolute, which can now be found on the SATURATED LIQUID curve at Point "B."

This process dropped the temperature of the liquid from 86° F. to 5° F., thereby reducing its heat content from Point "A" on the Chart (27.72 B.t.u. per lb.), to Point "B" (9.32 B.t.u. per lb.), accounting for a net loss of 18.4 B.t.u./lb.

This means then that the system must, to all practical purposes, extract 18.4 B.t.u. per lb. of liquid refrigerant to reduce the initial liquid temperature of 86° F. to 5° F. which is that of the evaporator.

LATENT HEAT OF VAPORIZATION DEFINED

The LATENT HEAT OF VAPORIZATION practically defined in its application here to our problem, is the heat required to "boil" the liquid refrigerant into a vapor state. The liquid refrigerant thereby accomplishes its cooling effect by this boiling process. As the liquid refrigerant enters the evaporator, because of the heated air being passed over the evaporator, it starts to boil and vaporize and it continues to boil and vaporize as it flows through the "passes" of the evaporator, taking on more and more heat.

Properly metered and properly subjected to the pre-design amount of heat, through the latent heat of vaporization by the air being passed over the evaporator, it changes ultimately into a saturated VAPOR, as shown on the Mollier Chart at Point "D." Note that its heat content is here at about 80 B.t.u.

As a result of the foregoing the amount of heat extracted by vaporizing 1 lb. of R-12 at 5° F. liquid as indicated by the Chart is 69.47, which is the Latent Heat of Vaporization.

This 69.47 B.t.u. per lb. cannot be considered as wholly available in accomplishing the required cooling job, because the difference between the 86° F. liquid or 27.72 B.t.u./lb. and the 5° F. liquid or 9.32 B.t.u./lb. had to be used up in cooling the liquid down to the 5° F. point, therefore, this difference of 18.4 B.t.u./lb. must be deducted from the 69.47 B.t.u. total giving us only 51.07 B.t.u./lb. as the NET REFRIGERATING EFFECT.

When the Suction Vapor leaves the evaporator, providing the liquid has been worked on thoroughly in the evaporator to bring about the vapor state, it should start to be warmed; heat added to it warms the gas or vapor above Saturation Temperature. However, its pressure will not noticeably change.

For purposes here assume that the vapor being returned is warmed to 65° F. or SUPERHEATED 60° F.; this can be found then at Point "E" on the Chart which is the condition of the vapor at which it enters the compressor and is located at that point where the constant pressure line of 26.5 p.s.i. Absolute crosses the 65° constant temperature line.

SUPERHEATING IN RELATION TO EXPANSION VALVE FUNCTION

In relation to this factor of "the liquid having been worked on thoroughly," it is necessary to explain this superheating process in relation to the expansion valve function. Obviously proper metering of the liquid to the coil, in relation to the amount of heat being passed over the evaporator must be coordinate; this balance is upset when the amount of liquid being metered through the valve is out of balance with the heat necessary to boil it into a vapor state.

This is reflected and seen at once in the temperature of the vapor being returned to the compressor. Normal return vapor temperature ranges between 61° and the 65° F. outlined above. Colder temperatures indicate unsaturated vapor with possible liquid being returned.

To return to our Chart, note that the area to the right of the Saturated Vapor Line represents Superheated Vapor. It represents vapor which has been heated beyoad the 5° F. point with no change in pressure; as a result Point "E" stays on the constant 26.51 Absolute Pressure line. Nevertheless, because it has been superheated it will fall in the area to the right of the Saturated Vapor Line.

If we locate on the horizontal line under Point "E," the actual heat content of the Superheated Vapor, we find it to be approximately 87 B.t.u.; as a result we find that the gain has been (using exactly 87.35 and 78.79) 8.56 B.t.u./lb. of superheat in transforming from 5° F. saturated vapor to 65° F. superheated vapor, with the pressure staying constant.

ENTROPY in this case or any other case, enters the picture to account for the ratio of the heat content to the Absolute Temperature and becomes a factor for consideration as follows:

As the Suction Gas enters the compressor it immediately enters the cycle of compression. This at the 65° F. optimum referred to. The object of compression is to get it to the condensing pressure originally started out with, that is 107.9 Absolute, 93.2 p.s.i.g., and a temperature of 86° F.

The compression cycle involves the necessary work to be done on the refrigerant in order to accomplish this and the by-product involved energy as heat; the net result is that heat content of the vapor increases, temperature rises, and pressure rises.

In this cycle it must be remembered that the ratio of heat content to the absolute temperature, or ENTROPY, remains constant. Thus, it can be said for practical purposes that the temperature of the vapor rises in the same ratio as the heat content. Thus by locating Entropy on the Chart it can be seen that "E" is between the two Entropy lines .18 and .19 and can be estimated, according to Reed, at .187.

(To Be Continued)

Frank M. Conroy Dies

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